Indian nuclear strategy 1947-1991.

Cheema, Mohammad Zafar Iqbal

INDIAN NUCLEAR STRATEGY
1947 - 1991

Mohammad Zafar Iqbal Cheema
Department of War Studies
King's College, London
University of London

Thesis submitted to the University of London
for the Degree of Doctor of philosophy
August, 1991

ABSTRACT

This thesis examines Indian Nuclear Strategy from 1947 to 1991. It explores India's political and strategic rationale, and the *modus operandi* for the development of a nuclear weapons capability. The central argument in the thesis is that there has been a coherent and continuous strategic rationale in India's development of its nuclear weapons capability. The study is carried out in the light of historical and political developments which influenced the Indian nuclear decision-making process. Chapter One is an introduction which outlines various dimensions of Indian nuclear strategy and the methodology adopted for its study. Chapter Two explores the historical background and doctrinal foundation of Indian foreign and security policies which set the general terms under which Indian nuclear policy operates. Its purpose is to understand the inspirational base and guidelines for the development of India's nuclear power programme and its weapons capability. Chapter Three traces out the origin of India's development strategy formulated to design a nuclear weapons option within the structural framework of the civilian nuclear programme in the Nehru era. Chapter Four explores the transformation from a nuclear option to a weapons capability in the period between 1964 to 1977 under the influence of various political, diplomatic and domestic inputs. An assessment of regional inputs such as Pakistan's development of a nuclear weapons capability is carried out in Chapter Five to evaluate their impact in the proper perspective. Chapter Six explores the tenets of India's nuclear policies under successive governments from Mr. Morarji Desai in 1977 to the present and their effect on its nuclear weapons capability. Chapter Seven provides an assessment of various elements of Indian nuclear weapons capability and explores the strategy governing its possible employment. Broad conclusions are offered in Chapter Eight.

TABLE OF CONTENTS

		Page
ABSTRACT		2
ACKNOWLEDGEMENTS		4
ABBREVIATIONS		5
Chapter One	INTRODUCTION	7
Chapter Two	HISTORICAL AND POLITICAL BACKGROUND	27
Chapter Three	INDIAN NUCLEAR STRATEGY IN THE NEHRU ERA: CREATING A NUCLEAR WEAPONS OPTION	57
Chapter Four	INDIAN NUCLEAR STRATEGY: 1964 TO 1977 FROM NUCLEAR OPTION TO A WEAPONS CAPABILITY	97
Chapter Five	PAKISTAN'S NUCLEAR POLICY AND ITS STRATEGIC INPUT INTO THE INDIAN NUCLEAR DECISION-MAKING	155
Chapter Six	INDIAN NUCLEAR STRATEGY: 1977 TO 1991 EXPANDING THE WEAPONS CAPABILITY	207
Chapter Seven	INDIAN NUCLEAR WEAPONS CAPABILITY: AN ASSESSMENT	256
Chapter Eight	CONCLUSION	313
APPENDICES		324
FIGURES / GRAPHS		73, 261, 275, 279 and 283
BIBLIOGRAPHY		334

ACKNOWLEDGEMENTS

I owe the deepest gratitude to Professor Lawrence D. Freedman for his guidance and generous financial support. He has been a continuous source of encouragement, without which this work would not have been completed. I am grateful to Mr. C.J. Wilson, from the U.K. AEA at Harwell, to let me consult primary material on the Indian nuclear programme. I am thankful to Sally Marks from the National Archives in Washington DC for tracing the files on atomic energy in India and Regina Greenwell, Archivist at Lyndon B. Johnson Library, for advice and prompt despatch of documents. I am grateful to Warren H. Donnelly, a senior CRS specialist, who allowed me to consult and photocopy material from his collection. Thomas Cochran from the Natural Resources Defense Council deserves my special thanks who placed at my disposal the files of the Council. I wish to thank Ann Herpel from the National Security Archives (Washington DC) for helping me to collect documents from the Archives' catalogue on nuclear non-proliferation. I am grateful to Leonard S. Spector, Gary Milholin, Richard P. Cronin and Thomas P. Thorton who afforded time for discussions and provided useful material from their own collections. Robert Flaten, the Director Pakistan Affairs and Scot Butcher, the Director Indian Affairs at the State Department, and Shirin Tahir-Kheli at the NSC were kind to let me benefit from their views. I am also thankful to Air Commodore (retd.) Jasjit Singh who arranged seminars for me to elicit a wide range of Indian opinions and let me copy material from the IDSA's library at New Delhi. I am indebted to Pran Chopra, Kuldip Nayyar and K. Subrahmanyam who were very kind to afford time for lengthy interviews. I am grateful to DR. P.I. Cheema for arranging annual reports of the Indian MOD and the PAEC. I am equally grateful to Thomas E. Halverson for his valuable comments on the type-script, editing and proof-reading.

ABBREVIATIONS

ACDA	ARMS CONTROL AND DISARMAMENT AGENCY
AEA	ATOMIC ENERGY AUTHORITY
ASLV	AUGMENTED SATELLITE LAUNCH VEHICLE
BARC	BHABHA ATOMIC RESEARCH CENTRE
CAN	CANADA
CENTO	CENTRAL TREATY ORGANIZATION
CRS	CONGRESSIONAL RESEARCH SERVICE
DAE	DEPARTMENT OF ATOMIC ENERGY
ENDC	EIGHTEEN NATIONS DISARMAMENT COMMITTEE
ENR	ENVIRONMENT AND NATURAL RESOURCES
FBR	FAST BREEDER REACTOR
FBTR	FAST BREEDER TEST REACTOR
FRUS	FOREIGN RELATIONS OF THE UNITED STATES
GCD	GENERAL AND COMPLETE DISARMAMENT
GOI	GOVERNMENT OF INDIA
GOP	GOVERNMENT OF PAKISTAN
GSLV	GEO-STATIONARY SATELLITE LAUNCH VEHICLE
IAEA	INTERNATIONAL ATOMIC ENERGY AGENCY
IAEC	INDIAN ATOMIC ENERGY COMMISSION
ICBM	INTER-CONTINENTAL BALLISTIC MISSILE
ICWA	INDIAN COUNCIL OF WORLD AFFAIRS
IDSA	INSTITUTE OF DEFENCE STUDIES AND ANALYSES
IGCAR	INDIRA GANDHI CENTRE FOR ATOMIC RESEARCH
INFCE	INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION
IN	INDIA
IPKF	INDIAN PEACE KEEPING FORCES
IRBM	INTERMEDIATE-RANGE BALLISTIC MISSILE
KARP	KALPAKKAM REPROCESSING PLANT
KANUPP	KARACHI NUCLEAR POWER PROJECT
MAPS	MADRAS ATOMIC POWER STATION
MOD	MINISTRY OF DEFENCE
MT	METRIC TONNES
MWe	MEGAWATS OF ELECTRICITY

NAPP	NARORA ATOMIC POWER PROJECT
NASA	NATIONAL AERONAURTICAL AND SPACE ADMINISTRATION
NNPA	NUCLEAR NON-PROLIFERATION ACT
NNWS	NON-NUCLEAR WEAPON STATES
NPT	NON-PROLIFERATION TREATY
NSC	NATIONAL SECURITY COUNCIL (UNITED STATES)
NSG	NUCLEAR SECURITY GUARANTEE
NWS	NUCLEAR WEAPON STATES
NWFZ	NUCLEAR WEAPONS FREE ZONE
PAEC	PAKISTAN ATOMIC ENERGY COMMISSION
PARR	PAKISTAN ATOMIC RESEARCH REACTOR
PHWR	PRESSURIZED HEAVY-WATER REACTOR
PINSTECH	PAKISTAN INSTITUTE OF NUCLEAR SCIENCE AND TECHNOLOGY
PNE	PEACEFUL NUCLEAR EXPLOSION
PREFRE	POWER REACTORS FUEL REPROCESSING
PSLV	POLAR SATELLITE LAUNCH VEHICLE
PU	PLUTONIUM
RAPS	RAJASTHAN ATOMIC POWER STATION
R & D	RESEARCH AND DEVELOPMENT
SAARC	SOUTH ASIAN ASSOCIATION FOR REGIONAL COOPERATION
SEATO	SOUTH-EAST ASIAN TREATY ORGANIZATION
SIPRI	STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE
SLV	SATELLITE LAUNCH VEHICLE
SNE	SUBTERRANEAN NUCLEAR EXPLOSION
SNF	SMALL NUCLEAR FORCES
SQN	SQUADRON
TAPS	TARAPUR ATOMIC POWER STATION
TRP	TROMBAY REPROCESSING PLANT
USAEC	UNITES STATES ATOMIC ENERGY COMMISSION
WGU	WEAPON-GRADE URANIUM

Chapter One

INTRODUCTION

The central argument in this thesis is that there has been a coherent and continuous strategic rationale in India's development of its nuclear weapons capability. The capability is designed within the overall structural framework of the civilian nuclear power programme and its genesis dates back to the Nehru era. Since its inception, the objective of the Indian nuclear programme has been, and continues to be, twofold; to develop nuclear power for civilian purposes, and to promote a parallel, built-in nuclear weapons capability. It was in Nehru's life-time that two dual-purpose facilities, a research-cum-power reactor, CIRUS (1960) and the Trombay Reprocessing Plant (1964) were completed. Both are free from international safeguards and were used for the 1974 nuclear test. Among nuclear capable states, India is the only one which has acquired a nuclear weapons capability directly from its civilian nuclear programme.

There is a substantial volume of literature on Indian nuclear policies and programme, delineating various rationales of development, defence, security and power. The available literature addresses these issues primarily from a political perspective, or in terms of the debate on nuclear weapons proliferation. From these viewpoints, the subject is, in fact, overwritten. However, it has not provided a broad enough framework of analysis to bring into perspective the Indian strategic objectives inherent in its nuclear capability and the strategy governing its employment. The size and sophistication of India's nuclear programme has equipped it with an imminent weapons capability. On the other hand, Indian nuclear policies have generated much ambiguity governing the employment of that capability. From an official standpoint, India denies that it has ever initiated a nuclear weapons programme since independence. Such denials create misunderstanding about the strategic objectives associated with the Indian nuclear programme. Objectives are crucial determinants in the formulation of strategy but difficult to identify in this case because of the pervading ambiguity. This makes it imperative to meticulously examine India's nuclear strategy under successive governments and their strategic objectives.

A survey of the literature suggests that it tends to follow nationalistic lines. The dominant Indian perspective originates from the pro-bomb lobbyists, K. Subrahmanyam and associates, who consider nuclear weapons an international currency of power monopolized by the great powers, and want India to go nuclear to realize the aspirations commensurate with its size.[1] This lobby is divided into two groups. K. Subrahmanyam and an equally ardent group want an immediate commitment by the Indian government to develop nuclear weapons. Second group of the pro-bomb lobby wants a graduated
new development of nuclear weapons capability
nuclear response from India in accordance with and adequate to existing threats, nuclear and conventional.[2] A considerable further literature is inspired by various perspectives of security, defence, deterrence and power; reflecting different degrees of commitment to the acquisition of nuclear weapons by India.[3] A small but growing anti-nuclear lobby wants India to stick to the principles of non-violence.[4] Some scholars

---

[1] K Subrahmanyam (ed.), *NUCLEAR MYTHS AND REALITIES* (New Delhi, ABC Publishing House, 1981), and *A STRATEGY FOR INDIA FOR A CREDIBLE POSTURE AGAINST A NUCLEAR ADVERSARY* (New Delhi, Institute of Defence Studies and Analyses [hereafter IDSA], 1968).

[2] Bhabani Sen Gupta, *NUCLEAR WEAPONS: POLICY OPTIONS FOR INDIA* (New Delhi, Sage Publications, 1983).

[3] See for example, T.T. Pouloose (ed.), *PERSPECTIVES ON INDIA'S NUCLEAR POLICY* (New Delhi. Young Publishers, 1978).

[4] Dhirendra Sharma, *INDIA'S NUCLEAR ESTATE* (New Delhi, Lancer Publishers, 1983).

believe that the official nuclear policy in the Nehru era had exclusively peaceful purposes, but the decision to go nuclear was thrust upon India by China's entry into the nuclear club.[5] Many more believe that India has no choice but to develop nuclear weapons in view of Pakistan's nuclear pursuits.[6]

Indian scholars based in the West present a more balanced view of India's nuclear capability, and tend to address Indian nuclear policy with varying degrees of skepticism about its peaceful intent.[7] Ragu G.C. Thomas believes that India's nuclear policy combines defence and development motives, and its nuclear and space programmes are geared to meet these objectives. But he does not identify the stage when the two objective were integrated.[8] Only a few think that the Indian nuclear policy of peaceful intent is a 'facade' and the 1974 test was 'India's initial, formal, and public step towards a strategic weapons capability'.[9]

The lines of division among Western authors on Indian nuclear policy are less sharp and there is almost a consensus that the Indian nuclear programme was initially peaceful but a weapons option was triggered by the first

---

[5] G.G. Mirchandani, *INDIA'S NUCLEAR DILEMMA* (New Delhi, Popular Book Services, 1968) and Gupta, pp. 1-5.

[6] B.M Kaushik, *PAKISTAN'S NUCLEAR BOMB* (New Delhi, Sopan Publishing House, 1980), and D.K. Palit and P.K.S. Namboodri, *PAKISTAN'S ISLAMIC BOMB* (New Delhi, Vikas, 1980).

[7] Ashok Kapur, *INDIA'S NUCLEAR OPTION: ATOMIC DIPLOMACY AND DECISION MAKING* (New York, Praeger Publishers, 1976) and *INTERNATIONAL NUCLEAR PROLIFERATION: MULTILATERAL DIPLOMACY AND REGIONAL ASPECTS* (New York, Praeger, 1979).

[8] Ragu G.C. Thomas, 'India's Nuclear and Space Programs: Defense or Development,' *World Politics*, 38 (2), January 1986.

[9] Onkar Marwah, 'India's Nuclear and Space Programs: Intent and Policy', *International Security*, 2 (2), Fall, 1977.

Chinese nuclear test in 1964.[10] It is widely believed that India used civilian nuclear facilities acquired from abroad for exclusively peaceful purposes to develop its nuclear weapons capability and has therefore, violated its international obligations.[11] However, there is a parallel consensus that global nuclear issues, including the Indian one, are best addressed within the perspective of non-proliferation of nuclear weapons.[12] Rodney W. Jones has written few volumes from a futuristic viewpoint on the type of small nuclear forces (SNF) that might be developed in the South Asian region.[13] However, his projections are primarily based upon speculative assumptions and not supported by evidence. The Pakistani scholarly contribution on India's nuclear development is limited, and the existing volumes view it in terms of an emergent threat which has exacerbated Pakistan's security

---

[10] George H. Quester, *THE POLITICS OF NUCLEAR WEAPONS* (London, The John Hopkins Press, 1973). Many other Western authors have taken a similar line after Quester.

[11] Roberta Wohlstetter, BHUDHA SMILES: ABSENT-MINDED PEACEFUL AID AND THE INDIAN BOMB, U.S. Energy Research and Development Administration, Monograph 3, (49-1), 3747, 10 April 1977, Leonard S. spector, *THE UNDECLARED BOMB* (Cambridge Mass: Ballinger, 1988), and Spector with Jacqueline R. Smith, *NUCLEAR AMBITIONS: THE SPREAD OF NUCLEAR WEAPONS 1989-90* (Boulder, Westview Press, 1990), and many others.

[12] George Quester, (ed). *NUCLEAR PROLIFERATION: BREAKING THE CHAIN* (Wisconsin, the University of Wisconsin Press, 1981), William C. Potter, *NUCLEAR POWER AND NONPROLIFERATION* (Cambridge Mass: Gunn & Hain Publishers, 1982), Joseph Goldblat (ed.), *NUCLEAR PROLIFERATION: THE WHY AND WHEREFORE* (Stockholm, SIPRI, 1985), Leonard S. Spector, *NUCLEAR PROLIFERATION TODAY* (Cambridge Mass: Ballinger, 1984) and many more.

[13] Rodney W. Jones, (ed.), *SMALL NUCLEAR FORCES AND U.S. SECURITY POLICY* (Lexington, Lexington Books, 1984), and *SMALL NUCLEAR FORCES*, The Washington Papers / 103, Vol. XI (Washington, Praeger, 1984).

dilemma.[14] Akhtar Ali has tried to conceptualize the Indo-Pakistan nuclear stalemate in his later work but has gone beyond than the available evidence allows. The Pakistani periodical literature on the subject is also limited.[15]

This survey of the literature reveals a gap between India's stated nuclear objectives and those underlying its nuclear capability. This is so because the primary focus of the literature is upon the political dimensions of the Indian decision-making process and it ignores the technological orientation and structure of the Indian nuclear programme. There is no doubt that the development of nuclear weapons is inherently a political decision. However, an exclusively political criterion to assess whether or not a country is pursuing a nuclear weapons capability is misleading if that country fosters ambiguity about its nuclear intentions. India appears such a case. It has a large and sophisticated nuclear industry based upon dual-purpose technologies and refuses to allow the verification of its 'only peaceful use' by rejecting the non-proliferation regime and all its associated elements as discriminatory.[16] It carried out a nuclear test in May 1974 which provided it the requisite expertise to fabricate nuclear weapons even if Indian statements are taken at

---

[14] Akhtar Ali, *PAKISTAN'S NUCLEAR DILEMMA: Energy and Security Dimensions* (Karachi, Economist's Research unit, 1984) and *SOUTH ASIA: NUCLEAR STALEMATE OR CONFLAGRATION* (Karachi, Publishers United for REAP, 1987). ~~There is a lot of periodical literature from Pakistani authors on Indian nuclear development.~~

[15] Pervaiz Iqbal Cheema, 'India's Nuclear Goals and Policy', *Regional Studies*, (5), 2, Spring 1987 and, 'Pakistan's Nuclear Option', *The Journal of South Asian and Middle Eastern Studies*, 7, Summer 1984.

[16] Non-proliferation regime is mainly based upon the NPT, full-scope safeguards exercised by the IAEA and restrictions on the supply of nuclear weapons technology to the non-nuclear weapon states (NNWS).

their face value that it was a peaceful nuclear explosion (PNE). There is no fundamental difference between the two, though techniques vary at times.

Over the years, Indian nuclear diplomacy has provided the rationale for the development of a safeguards-free nuclear programme and a weapons capability disguised within it. The rationale has varied from government to government, for adjusting to the operative international environment, but the underlying strategic content remains unchanged. This rationale began with India's rejection of the international safeguards system as 'inequitable' during the Nehru era (1947-64), and then continually shifted. It focussed on the nuclear threat from the Peoples Republic of China and the 'inadequate' nuclear security guarantees to cope with that threat during the brief tenure of Mr. Lal Bahadur Shastri (1964-66). India rejected the Treaty on Non-Proliferation of Nuclear Weapons of 1968 (NPT) during the first tenure of Mrs. Indira Gandhi (1966-77). Subsequently, the Pakistani nuclear threat became the centre of foci of Indian nuclear diplomacy during the governments of Mrs. Gandhi (1980-984) and her son, Rajiv Gandhi (1984-89). The Pakistani nuclear threat continues until today. All these rationales constitute the basis of Indian nuclear diplomacy which has consistently provided a protective shield against verification of the official Indian claim that its nuclear programme is 'exclusively for peaceful purposes'. Notwithstanding the rationale, the parallel development of a nuclear weapons capability has been pursued with tenacity, dexterity and finesse but without formal acknowledgement.

However, with the continual growth of a sizeable nuclear weapons capability, the gap between an evident military dimension of the Indian nuclear programme and its public declarations of 'exclusively peaceful use', has widened to highlight the underlying contradictions. While no Indian government has ever acknowledged the initiation or existence of a nuclear weapons programme, there is an increasing volume of collateral evidence which substantiates the view that India can deploy nuclear weapons in any future conflict at a relatively short notice.[17] Some sources point out that it may have fabricated an arsenal of unassembled nuclear weapons. A Washington-based report, quoting U.S. intelligence and State Department sources, suggests that India has been producing nuclear-weapons components since November 1986.[18] One report suggests that India has already produced an arsenal of several low-yield nuclear weapons.[19] Another source points out that, "India has nuclear-weapons components on the shelf and a special team ready to assemble them".[20] Full assembly is not necessary. In the late 1940s, the United States stored the plutonium and highly enriched uranium cores of its nuclear weapons separately from the other components. During a testimony before the Senate Committee on Government Operations on 18 May 1989, the Director of Central Intelligence Agency (CIA), Mr. William Webster, stated that there were many indications that India was involved in the work on nuclear and thermonuclear weapons.[21] Even if the accuracy of several such reports is questionable, no one has doubted India's capability to fabricate and deploy nuclear weapons in a future conflict since its nuclear test in 1974.

---

[17] Spector with Smith, p. 79.

[18] Richard Sale, "India Said to Upgrade Nuclear Arsenal," United Press International, 19 March 1988 (AM Cycle), in Spector, *THE UNDECLARED BOMB*, p. 106.

[19] 'India "has a Nuclear Arsenal" ', THE INDEPENDENT, 22 March 1988.

[20] WEEKLY TIME MAGAZINE, 3 April 1989, p. 16.

[21] NEW YORK TIMES, 19 May 1989, p. A7 and WASHINGTON POST, 19 May 1989, p. A29.

India has a large number of long-range, high performance attack aircraft capable of nuclear delivery missions after necessary modifications (the Jaguars, MIG-27, and MIG-29 fighter / interceptors and Mirage-2000).[22] All of these aircraft have a payload capacity of about 2000 pounds which is considered enough to deliver an early generation of nuclear weapons. All the air bases and strategic installations of India's main adversary, Pakistan, are within the range of the Indian Air Force. On 22 May 1989, India successfully test-fired a ballistic missile named Agni (fire), which has 2500 km (1,500 miles) range and 2,200 pounds (1,000 kg) payload capacity.[23] The Agni provides a basis for an IRBM capability to engage many industrial and strategic targets in China and the Indian Ocean if deployed in adjacent areas.

Whether India has actually integrated nuclear weapons into its armed forces is not known. There is no public evidence to identify the support mechanism for their immediate assembly in crisis situations, deployment strategy and target acquisition alternatives. These require elaborate procedures, and command, control and communication (C^3) infrastructure which may not escape international scrutiny by satellite reconnaissance. However, it is difficult to dismiss the possibility altogether that, given its fears of a Pakistani nuclear threat, India would not have taken the necessary steps to cope with an extreme eventuality.

India's response to its alleged involvement in the development of nuclear weapons is equivocal. Successive governments have not only refuted the available evidence but have denied any intention of producing nuclear weapons. However, the former Prime Minister, Mr. Rajiv Gandhi, did

---

[22] MILITARY BALANCE 1988-89 (London, International Institute for Strategic Studies, 1989), pp. 160-62.

[23] WASHINGTON POST, 23 May 1989, p. A1.

state in response to a question about Pakistan's nuclear threat in 1985, that India has the capability [nuclear] to meet the Pakistani nuclear threat if its national security is threatened.[24] Gandhi reiterated that position in April 1987.[25] What could be the basis of these statements if India had never initiated a nuclear weapons programme? Is it an inescapable by-product of the Indian civilian nuclear programme or a deliberately designed capability within it, resulting from a cost-benefit analysis of an overt versus covert nuclear weapons capability? It suggests that India deliberately fosters ambiguity in its pursuit of a nuclear weapons capability. India thus escapes the price of an open and dedicated nuclear weapons programme in an international environment increasingly unfavourable to nuclear proliferation, but without sacrificing its vital strategic interests. It has therefore, devised a nuclear strategy to safeguard its national interests without paying the penalties. The policy of ambiguity began with Nehru and the successive Indian Prime Ministers pursued a similar course according to their own political circumstances, though with less subtlety.

The study of Indian nuclear strategy cannot be confined to a particular period because continuity and coherence emerge as central elements in its formulation since 1947. It happened quite often that a particular decision taken by one government could not be implemented in its tenure due to a wide range of domestic and international difficulties. It was completed later on by the successor government. For example, the decision to carry out an underground nuclear explosion was originally taken by the government of Prime

---

[24] The late Prime Minister Rajiv Gandhi's interview to _LE MONDE_, 5 June 1985, translated in Foreign Broadcast Information Service (FBIS) / South Asia, 5 June 1985, p. E-1.

[25] _REUTERS_, 27 April 1987, translated in FBIS / South Asia, 27 April 1987, p. E-1.

Minister Shastri in November 1964. However, the explosion was actually carried out under Mrs. Indira Gandhi's government, and not until 1974. It can also be argued that there was nothing altogether new in the decision of Mr. Shastri's government. Beaton and Maddox concluded that Mr. Nehru, advised by Dr. Homi J. Bhabha, decided in favour of an option to produce a nuclear device in 1962 if it became politically or militarily necessary.[26] Ashok Kapur has also concluded that Nehru had sanctioned a PNE development before his death.[27] In any case, such type of decisions are intermediate steps towards a higher objective, i.e. the development of a nuclear weapons capability. In this case, technological determinism indicates a weapons oriented direction during the Nehru era, rather than the professed, "exclusively peaceful use." The technological facts point toward the development of a nuclear weapons option. Nehru's government assigned priority to the completion of two weapons oriented projects; the CIRUS reactor in 1960 and the Trombay Reprocessing Plant in 1964. These facilities were used by India to develop a nuclear device and test it in 1974.

Since independence, there has been a general consensus on Indian national interests among India's ruling elite, and on the role and imperatives of power in the pursuit of national security. This consensus constitutes the doctrinal foundation of Indian nuclear thinking. The formulation of Indian nuclear strategy exemplifies the intra-governmental consensus. It is the only policy area where no previous government's policy decisions have been abandoned. Successive Indian governments continued their predecessors' nuclear

---

[26] Leonard Beaton and John Maddox, _THE SPREAD OF NUCLEAR WEAPONS_ (London, Chatto & Windus for The Institute for Strategic Studies, 1962), pp. 141-142.

[27] Kapur, _INTERNATIONAL NUCLEAR PROLIFERATION: MULTI-LATERAL DIPLOMACY AND REGIONAL ASPECTS_, p. 184.

policies and advanced the underlying objectives. Therefore, the pedigree of nearly all decisions and policies dates back to Nehru. Nehru's was an epoch-making era which shaped Indian thinking and left an indelible impression on subsequent Indian foreign and security policies. Nehru's nuclear policy has been advanced without substantial changes, depending upon the time, resources and constraints. Indian nuclear strategy, therefore, must be studied as a continuum rather than a terminal process. This study is organized on that basis.

ORGANIZATION OF CHAPTERS

Chapter One (Introduction) outlines the various dimensions of Indian nuclear strategy. Chapter Two examines the historical and political background of Indian policies and their influence on the formulation of India's nuclear strategy and its doctrinal foundation. It analyses Nehru's perceptions about international relations, the role of power, non-violence, non-alignment and disarmament. It underlines Nehru's deep-rooted influence on Indian political thinking which shaped the policies of all subsequent Indian governments. It also describes India's aspirations for a great power role, and the management of Indian national security through diplomacy and the use of force. Despite Nehru's strong influence on every aspect of Indian statecraft, there was a shift from reliance on diplomacy during his era to the development of a strong military capability in the post-Nehru era. Chapter two also explores perceptions which underlay Indian foreign and security policies, and examines the relationships within the policy-making process. Does India consider itself a legitimate heir of the British Raj and its Forward Defence Policy? Or alternately, is such a pre-eminent Indian position a logical result of its sheer size? Why have India's South Asian neighbours perceived its inherent strength as potentially hegemonic in nature, and why has India been unable to assuage their apprehensions?

Chapter Three examines the formative phase of India's nuclear strategy and explores the creation of a weapons option in the Nehru era. It indicates that the foundation of a nuclear weapons capability was laid down in the Nehru era. Nehru himself was the political architect of that objective, and its technological framework was conceived by Dr. Bhabha. Nehru also created the basis of an ambiguous nuclear posture to rationalize India's development of a nuclear weapons option. The chapter describes the approach adopted by Nehru to realize the twin objectives of economic development and nuclear power. The Indian nuclear programme was considered instrumental to realize these elements of a "Greater India". It underlines the paradoxes and equivocation in Nehru's nuclear policy, between his call for general and complete disarmament and simultaneous rejection of unilateral nuclear disarmament. He appeared to renounce nuclear weapons but steadfastly resisted the application of international safeguards to India's nuclear programme because he considered them inequitable. Nehru spoke about defending India "by all means at her disposal", including "the latest scientific devices for its protection."[28] Yet he also appeared to give definite assurances against the use of nuclear power for "evil purposes" not only by his own government, but "all future governments of India".[29]

The apparent contradictions in Nehru's approach towards India's acquisition or non-acquisition of nuclear

---

[28] Lorne J. Kavic, *INDIA'S QUEST FOR SECURITY: DEFENCE POLICIES, 1947-1965* (Berkeley and Los Angeles, University of California Press, 1967), p. 28.

[29] Jawaharlal Nehru, *JAWAHARLAL NEHRU'S SPEECHES VOL. III* (New Delhi, Government of India [hereafter GOI], 1958), p. 505.

weapons raise fundamental questions. How could a person of his statesmanship and pragmatism give assurances on behalf of "all future governments of India", when such assurances were not contractual in nature and could not be generally tenable in view of the volatile nature of international politics? What credibility would those assurances have in examining Indian nuclear strategy in the light of Prime Ministers Shastri and Mrs. Indira Gandhi's nuclear policies. Should Nehru's assurances be taken as deliberate equivocation or inadvertent paradoxes? These questions make it imperative to re-examine the substance of his thinking about the use of nuclear power for peaceful and military purposes.

This evaluation is carried out by using declassified documents of the U.S. State Department which reveal that India had an underlying interest in nuclear explosions technology as early as January 1954.[30] Dr. Bhabha then inquired from the U.S. officials whether the U.S. AEC and other agencies would invite the cooperation of the Indian Atomic Energy Commission in collecting observational data on atomic explosions.[31] Bhabha suggested the establishment of an installation for such purposes in India.[32] This chapter also analyses Indian nuclear development strategy, and details how Bhabha worked out the blueprints for the Indian nuclear programme and provided the guidelines for its development. It took into account its future military employment but without an overt manifestation. He adopted a development strategy based upon dual-purpose technologies with room for progressive indigenisation to achieve rapid self-sufficiency to

---

[30] General Records of the U.S. Department of State [hereafter Department of State]; National Defense Affairs of India, Central Decimal File 891.2546 / 1-2954, dated 29 January 1954 (Washington DC, National Archives, 1989).

[31] ibid, p. 1.

[32] ibid.

protect the Indian nuclear programme from external pressures and surveillance. His nuclear planning catered for the eventual military employment of the programme. Bhabha's objectives were shared by Nehru.

Chapter Four analyses the transformation from a nuclear option to a weapons capability in the period 1964 to 1977. This policy is addressed in the light of the nuclear issues and developments of that period. The chapter underlines the Indian threat perceptions and responses to China's first nuclear test in October 1964. It suggests that Mr. Shastri rejected nuclear security guarantees against the Chinese nuclear threat as inadequate. He took a decisive step forward in nuclear strategic planning by formally sanctioning a Subterranean Nuclear Explosion (SNE) Project on Bhabha's advice.[33] An analysis of Indian nuclear diplomacy and its significance in the formulation of nuclear strategy is also provided in this chapter. It also describes how India orchestrated its nuclear diplomacy to create and maintain legitimacy for a safeguards-free nuclear weapons capability by balancing its rejection of international safeguards with support for global arms control and disarmament. Indian adherence to the Partial Test Ban Treaty and its rejection of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) project a coherent and well articulated diplomacy supportive of its overall strategic nuclear objectives.

Mrs. Gandhi rejected the NPT and decided to test a nuclear device in May 1974. India carried out a "peaceful nuclear explosion" ostensibly for the purposes of subsoil civil nuclear engineering projects.[34] The 1974 nuclear explosion raised complex questions, many of which have yet to

---

[33] Wohlstetter, p. 109.

[34] Annual Report 1974-1975: Department of Atomic Energy (Bombay, GOI, 1975), p. 7. This Report described the 1974 test as a successful experiment.

be answered satisfactorily. For example, where did India apply the benefits of that "successful nuclear experiment" over the past 17 years? The use of a PNE for civil engineering purposes is something which did not before, and still do not exist in India. If it was a weapon test, why India did not openly build a nuclear force immediately after the experiment? Was the PNE label a convenient rationale for the Indian government to escape international sanctions, to which an openly acknowledged weapon test would have been subjected? Whether peaceeful or otherwise, the experiment did give India a capability to fabricate nuclear warheads because a PNE is generally regarded as a functional equivalent of a weapon test. The answers to these questions are explored with reference to available documentary evidence which indicates the fallacy of the entrenched assumptions that the 1974 nuclear test was a PNE.

This chapter also analyses domestic imperatives of Indian nuclear politics. The roles of intra-governmental and extra-governmental groups, and political parties in the formulation of Indian nuclear policy after the Chinese nuclear test is added. Post-Nehru nuclear politics is divided into two periods, the first nuclear debate (1964 to 1968) which was followed by the first nuclear test in 1974, and the second nuclear debate (1980 to 1991). Their contribution to the Indian decision-making process is assessed. In both debates, the role of public institutions, political parties, strategic elite and academic experts is discussed. In order to maintain a sequential pattern, the first nuclear debate is analysed in this chapter and a discussion of the second nuclear debate is included in Chapter Six.

Chapter Five evaluates Pakistan's development of a nuclear weapons capability and its impact on Indian nuclear decision-making. It indicates that Pakistan's rapid development of a nuclear weapons capability in the last decade and a half is viewed as a threat by India. Pakistan, like India, denies the military nature of its nuclear programme as a matter of government policy. However, Pakistani officials are less guarded in private about the military purpose of its nuclear capability.[35] The evident Pakistani rationale for the nuclear development is a perception of an Indian nuclear threat or blackmail activated by the 1974 nuclear test. Despite its declarations of peaceful intent, Pakistan's nuclear development has accelerated the Indian nuclear military development. This chapter specifically addresses the questions such as, how the 1974 nuclear test exacerbated Pakistani threat perceptions. It also describes how Pakistan attempted swiftly to neutralize the emergent nuclear threat from India by developing its own nuclear weapons capability. It is noteworthy that Pakistan developed a weapons capability more rapidly than India, though it lags behind in numbers and delivery capabilities. Pakistan's development of a nuclear weapons capability acted as a catalyst, accelerating Indian nuclear weapons capability. The chapter presents nuclear competition between India and Pakistan and the cycle of suspicion, reaction and the resultant stimulus in both countries nuclear weapons programmes. Indo-Pakistani nuclear competition has developed into an action-reaction trap and both states are now pursuing an undeclared race for the acquisition of nuclear arms. The dynamics of Indo-Pakistan nuclear competition are complex. An evaluation of this complexity is carried out in the context of their historical relationship which is marred by hostility and mistrust. It is

---

[35] For example, the late President of Pakistan, General Zia-Ul-Haq claimed the existence of a Pakistani nuclear deterrent against India. See, Report of the Visit to India and Pakistan by the Delegation of the Carnegie Task Force on Non-Proliferation and South Asian Security, June-July 1988 (Washington DC, Carnegie Endowment for International Peace, 1988), unpublished, pp. 7-8.

at times punctuated by belated attempts for normalization.

Chapter Six offers an analysis of the expansion of Indian nuclear weapons capability from 1977 to 1991 in the light of the developments of that period. The brief tenure of the first Janata government (1977 to 1980) was a period of inaction in India's nuclear development. Mrs. Gandhi regained the premiership in 1980 and restarted from where she left in 1974-77 to expand India's nuclear weapons capability. The expansion she initiated in 1980-84 culminated under the government of late P.M. Rajiv Gandhi (1984-89) and second Janata regime (1989-1991). The 1980s saw an advancement of Indian nuclear weapons capability, particularly R & D in nuclear military expertise, thermonuclear weapons and delivery systems. Indeed, all elements of Indian nuclear strategy were advanced. India's rejection of Pakistani bilateral nuclear arms control proposals suggests that any framework of regional non-proliferation is ancillary to Indian strategic nuclear imperatives.

Chapter Seven is a critical assessment of Indian nuclear weapons capability from its inception. This study does not question the legitimacy of the Indian nuclear programme for the generation of nuclear power for civilian purposes and as a vehicle for its socio-economic development. However, it does question the credibility of the official Indian claim that its nuclear power programme has had exclusively peaceful purposes. The argument is based upon the premise that Indian nuclear strategy cannot be fully comprehended without a dispassionate analysis of the structural dynamics of its nuclear power programme. On the other hand, the Indian nuclear programme is very large in size and a full account of purely civilian facilities is beyond the scope of this study. Therefore, only those capacities are discussed which have either a dual-purpose or a weapons related significance. A brief account of its origin is provided to maintain the continuity of argument. The rest of the chapter analyses in details all the nuclear elements which form the basis of Indian weapons capability, like safeguards-free research and power reactors, technological infrastructure, heavy-water, nuclear materials, reprocessing plants, nuclear weapons technology and delivery systems. The data on these elements is based on the annual reports of India's Department of Atomic Energy and official Indian documents. While analyzing India's nuclear weapons capability, its various estimates by independent authors and institutions are taken into account but not relied upon unless supported by evidence. The calculations worked out in appendices I to X are original. Out of these, I to VIII deal with India and the rest with Pakistan.

Chapter Eight concludes the analyses of the foregoing chapters. Given the source limitations and the nature of subject, conclusions cannot be definitive. India and Pakistan do not officially admit the existence of their nuclear weapons programmes. Therefore, there is a need to be guarded against search for exact and precise answers to questions which are essentially normative.

This study is mostly based upon primary sources: statements of Indian Prime Ministers and government officials, Parliamentary debates, annual reports of the Department of Atomic Energy (DAE) and the Atomic Energy Commission (AEC) of India. The material from the U.S. archives has proved extremely useful for an evaluation of the Indian nuclear programme and policy in the 1950s. Information drawn from three files of the Department of State, Central file 791.5 MSP: National Defense affairs of India, Central File 791. 5611: Atomic Energy, Military use in India, and Central Decimal File 891.2546: Strategic Export; India, have proved very valuable to study the formative phase of Indian nuclear strategy. Information from the National Security File, Committee File - Committee on Nuclear Proliferation, India, and National Security File, Country File, India, from the Lyndon B. Johnson Library, has also been useful for the mid-1960s. National Security Archives in Washington DC provided a large number of documents and primary source material from its catalogue on nuclear non-proliferation (1989) which were pertinent to Indian nuclear weapons capability. Additional material was drawn from the Liddell Hart Centre for Military Archives, King's College, London, Natural Resources Defense Council, Washington DC, and the Congressional Research Service, which was helpful in analyzing the Indian nuclear programme and policy. A wide range of secondary source material has been explored, but not relied upon unless supported by independent corroborative evidence. However, it has been listed in the bibliography. A large number of serving and retired government officials, professional experts, academicians and journalists have been interviewed in New Delhi, Islamabad and Washington. These interviews proved very useful in the exploration of relevant literature, confirmation or rejection of reports and opinions, the validity of data, and improvement of my personal understanding and opinion.

There is a scarcity of documentary material originating from India and Pakistan which is directly related to their nuclear weapons capabilities because neither country declassifies the relevant documents. Both countries do not admit to have started a nuclear weapons programme. Secrecy has been the hallmark of their nuclear decision-making process. The only available primary documents from the two countries are annual reports of their atomic energy establishments which contain little information about their weapons capabilities. It is therefore, obviously difficult to write about the nuclear strategy of a state which has never admitted the military purposes of its nuclear power programme, even if it could deploy nuclear weapons at a relatively short notice. A wide gap exists between policy declarations and operational realties. Rhetoric and deliberate ambiguity has often obfuscated intentions. One must piece together a wide range of evidence to untangle the labyrinth, and make out a reasonably complete picture.

Chapter Two

HISTORICAL AND POLITICAL BACKGROUND

The determinants of Indian nuclear strategy must be first explored from a historical perspective. This requires an examination of the perception and vision of its architect, Mr. Nehru. He led the Indian nationalist movement and upon independence became India's first Prime Minister (1947 to 1964). An understanding of his conception of power and international politics, the role of non-violence, diplomacy, and use of force in inter-state relations is fundamental to a study of Indian policies. In order to appreciate the evolution of India's nuclear strategy, the doctrinal foundation of its foreign and security policies, their objectives and conduct in the light of Nehru's perceptions of Indian strategic interests is investigated. Indian policies of non-alignment vis-a-vis the superpowers and peaceful co-existence with China are also analysed in this chapter. Since India's foreign and security policies set the general terms under which Indian nuclear policy operates, their analysis will help to understand the inspirational base and principles which guided the development of the Indian nuclear power programme and its weapons capability. Indian aspirations for a regional great power role in South Asia are assessed. However, despite Nehru's strong influence on every aspect of Indian statecraft, the shift of policy from a primary reliance on diplomacy during his era to the development of military power in the post-Nehru era requires meticulous examination. An analysis of India's official declarations at home and abroad on disarmament is also included in this chapter. Finally, the role of domestic politics in nuclear decision-making is addressed and conclusions are summarized.

The genesis of India's external and internal policies invariably goes back to their formative phase in the Nehru era. Nehru was not only the architect of Indian foreign and security policies, but he also left an indelible mark on the national and international outlook of India. According to Michael Brecher, Nehru was 'the philosopher, the architect, the engineer and the voice of his country's policies towards the outside world'.[1] Former Canadian High Commissioner in India, Escott Reid's description of Nehru provided a glimpse of his image in India, and his influence on national policies. He wrote, 'For the people of India, he [Nehru] is the king as well as prophet and priest, for he is the symbol of unity of India; he is the spokesman of India, the head of its government. Some times, he behaves as if he were also the leader of opposition'.[2]

Nehru envisioned a **'Greater India'** [Maha Bharat] which would play a role in world affairs commensurate with its size and power potential.[3] He believed that India, despite being a great civilization based upon a rich history, had lost its due place under colonialism. He was determined that India's due place ought to be rediscovered with a new spirit enlightened by modern philosophy.[4] Nehru believed that India and China both were potential great-powers of some equivalence to the United States, the Soviet Union, and Britain. He considered Indian resources as diverse and vast as Chinese.[5]

---

[1] Michael Brecher, *INDIA'S FOREIGN POLICY: AN INTERPRETATION* (New York, Institute of Pacific Relations, 1957), p.9.

[2] Escott Reid, 'Nehru: an Assessment in 1957', *International Journal*, Summer 1964, p. 279.

[3] Jawaharlal Nehru, *THE DISCOVERY OF INDIA* (London, Meridian Books, 1951), pp. 35-45.

[4] *ibid*.

[5] *ibid*, p. 40.

He had a strong conviction that India would recapture its lost glory and power through dedicated efforts in the fields of scientific, industrial and economic development.[6] Therefore, he thought the Indian national interests required a vigorous pursuit of these objectives.

1. NEHRU'S CONCEPT OF POWER AND INTERNATIONAL POLITICS

India's perception of international politics, power, security and use of force was largely shaped by Nehru's thinking. Nehru was not a pacifist but a pragmatic statesman. He never held any altruistic pretensions about the Gandhian philosophy of non-violence as a principle of state policy. As he told the Lok Sabha on 15 February 1956: 'I am not aware of our government having ever said that they adopted the doctrine of Ahimsa [Non-violence] to our activities'.[7] He later reiterated that position: 'We were moved by these arguments, but for us and for the National Congress as a whole, the non-violent method was not and could not be a religion, or an unchallengeable creed or dogma'.[8] On another occasion he refused to endorse the policy of non-violence by asking: 'Do we all believe in non-violence, taking it fully to its utmost conclusion? I suppose not'.[9] Speaking to the Far East-American Council of Commerce and Industry in December 1956, Nehru admitted that India's approach to economic problems was not doctrinaire but pragmatic, except its insistence on the

---

[6] ibid, pp. 40-42 and 534-35.

[7] Lok Sabha Debates, part 2, vol. 1, 15 February 1956, columns 814-15.

[8] M.N. Das, *THE POLITICAL PHILOSOPHY OF JAWAHARLAL NEHRU* (London, George Allen and Unwin, 1961), p. 59.

[9] *Gandhi Marg*, (New Delhi), Vol. 6, 1962, p. 191.

democratic method.[10]

Nehru held a power-politics view of international relations and believed in the balance of power concept. His pre-independence views provide evidence of his belief in protecting India through a balance of power approach. He espoused this approach in a presidential address to the Kerala Provincial Conference of the Indian National Congress at Payyanur on 28 May 1928.[11] According to Kavic, the central premise of Nehru's views on balance of power stated:

> No country will tolerate the idea of another acquiring the commanding position [in India] which England occupied for so long. If any power was covetous enough to make the attempt, all others would combine to trounce the intruder. This mutual rivalry would in itself be the surest guarantee against an attack on India.[12]

G.S. Bajpai, Secretary-General of the Indian Ministry of External Affairs, stated in 1952 that the balance of power concept was neither evil nor incompatible with India's highest ideals.[13] He further stated that in a world of power-politics where military force was the only safeguard against a threat to national independence, India must develop its strength to safeguard its independence, to support its foreign policy and to maintain a power equilibrium in Asia.[14]

However, an over ambitious diplomacy presented as an alternative to military power was characteristic of Nehru's

---

[10] Department of State, FOREIGN RELATIONS OF THE UNITED STATES, [hereafter] FRUS, 1955-1957, Vol. VIII, South Asia, (Washington DC, USGPO, 1987), p. 341.

[11] Kavic, p. 23.

[12] ibid.

[13] G.S. Bajpai, 'India and the Balance of Power', in *INDIAN YEAR BOOK OF INTERNATIONAL AFFAIRS*, Vol. 1 (Madras, 1952), p. 4.

[14] ibid.

government. Indian policies of non-alignment and peaceful co-existence were claimed as politically and morally superior to the politics of power-blocs which were considered more prone to conflict and warfare.[15] Speaking at the Bangalore session of the Indian National Congress on 17 January 1960, Nehru stated that the philosophical basis of the Indian policies was wholly opposed to purely military modes of thought.[16] Nonetheless, as will be shown later on, the actual Indian policies proved contrary to their proclaimed ideals. There was no solid basis for Nehru's claim of politico-moral superiority of Indian policies.

Nehru's perception of India's strategic environment immediately after independence did not reflect a serious sense of threat. Pakistan was contemptuously disregarded until the mid-1950s, when it joined SEATO and CENTO and received sophisticated weapon systems and military aid from the United States. Indian threat perception rapidly changed after Pakistan became a member of the above two alliances. During a visit to India in December 1956, U.S. Secretary of State, John Foster Dulles, observed that hatred and fear of Pakistan was Nehru's dominant sentiment.[17] China was perceived as a friendly state. Nehru recognized the rise of China to a great power status as a major fact of the mid-twentieth century.[18] His subsequent policy toward China was based upon that premise. Nehru's government refused to accept the validity of international opinions about a communist threat to India. In his

---

[15] Jawaharlal Nehru, *INDIAN FOREIGN POLICY: SELECT SPEECHES, SEPTEMBER 1946-APRIL 1961* (New Delhi, Publication Division, Government of India [hereafter GOI], 1961), p. 24.

[16] Jawaharlal Nehru, *SPEECHES, 1953-1957* (New Delhi, Publications Division, GOI, 1958), pp. 266-67.

[17] FRUS, 1955-1957, Vol. VIII, p. 326.

[18] Nehru, *INDIAN FOREIGN POLICY: SELECT SPEECHES*, p. 304.

address to the Lok Sabha on 31 March 1955, Nehru condemned the practice of viewing everything from a communist or an anti-communist perspective.[19] He was extremely critical of cold-war military alliances, development of atomic weapons, racialism and the alleged tendency of Western Powers to intrude in Asian affairs.[20] Its perception of China as a friendly great power continued to influence Indian Foreign Policy until the late 1950s, when the Sino-Indian boundary dispute became sharp.[21] On 29 April 1954, India signed an agreement with China over Tibet which was considered to be a foundation of Sino-Indian relations in the future. The 1954 Sino-Indian Agreement, contained five principles of peaceful co-existence, generally known as *Panch Sheel* [five principles]:[22] (i) Renunciation of the use of force or mutual non-aggression, (ii) Non-interference in each other's internal affairs, (iii) Respect for each other's territorial integrity and sovereign equality, (iv) Peaceful resolution of disputes, and (v) Cooperation for mutual benefit and development.

Nehru believed that the West had failed to appreciate the evolution underway in Asia.[23] He thought that the U.S. made a great mistake by not voluntarily recognizing

---

[19] Department of State, National Defense Affairs of India, Central Decimal Files 791.00(W)/ 4-255, dated 28 May 1955.

[20] ibid.

[21] India and China have profound differences on the demarcation of their territorial boundary based on the McMahon line.

[22] Jawaharlal Nehru, *FOREIGN POLICY OF INDIA: TEXT OF DOCUMENTS 1947-64* (New Delhi, Lok Sabha Secretariat, 1966), p. 199.

[23] Memoranda of Conversation Between Secretary of State Dulles and Prime Minister Nehru, Prime Minister's Residence, New Delhi, March 9, 1956 (4 p.m.) and March 10, 1956, (10 p.m.), Department of State, Central File, 791.13/3-1056.

communist China at an early stage rather than doing it later under compulsion when there would be no choice. He often pronounced his distaste of Western policies as 'imperialistic and opportunistic'.[24] His government continued to oppose Western collective security arrangements like SEATO and CENTO on the premise that they enhanced existing tensions and brought the cold-war to Asia.[25] However, by the late 1950s, the Sino-Indian boundary dispute became too complex to be resolved through the framework of the *Panch Sheel*. Indian perception of threat from China accentuated in 1959-60 when both countries initiated precautionary military deployments on the border.

The United States' perception of India was initially influenced by its global imperative to search for potential Asian allies to join the 'Free World' in its struggle against communism. The fundamental premise of United States' post-1945 India policy originated from the fact that India was the largest country in South Asia and was strategically located. It could be a valuable asset in that struggle. The U.S. perceived that Soviet inroads in India would undermine Western influence in Asia.[26] To pre-empt this, the United States signed a military sales agreement with India in 1951 to help maintain its defence capability against the communist threat and protect its political sovereignty.[27] During the period 1951-1957, India received various types of military equipment and services worth $ 38,000,000 under the terms of the 1951 Military Sales Agreement.[28]

---

[24] FRUS 1955-1957, Vol. VIII, p. 47.

[25] ibid.

[26] Department of State, Central File, 791.5-MSP/3-1356, dated 13 March 1956.

[27] FRUS 1955-1957, Vol. VIII, p. 358.

[28] ibid.

Despite the best U.S. efforts to keep India protected from communist influence, the Soviet bloc made some inroads. Nehru continued to criticize the U.S. policies for not appreciating the 'Asian evolution', not recognizing China and bringing the cold-war to Asia.[29] In practical terms, enhanced trade between India and China, active Indian consideration of a Soviet offer to construct a large steel mill, and ever increasing exchange of delegations between India and the Communist bloc were the developments contrary to U.S. objectives.[30] On 19 November 1955, Bulganin and Khrushchev arrived in India in a bid to compete with the West for India's friendship.[31] Bulganin's attacks on Western sponsored military alliances complemented Nehru's criticism of SEATO and CENTO. It appeared to generate a greater political harmony between India and the Soviet Union. The Soviets succeeded at least in increasing the U.S. cost of keeping India in the Free World. Nehru attempted to keep a balance by criticizing the Cominform by saying that, "The functioning of the Cominform is an interference in other countries' affairs and is not compatible with the policy of non-interference". [32] However, it was less strident compared with his attacks on imperialism [Western]. President Eisenhower, apparently surprised over Nehru's anti-U.S. attitude, wrote a note to John Foster Dulles which read: 'In the Indian situation I am struck by the amount of evidence we have that Nehru seems to be often more swayed by personality than logical argument'.[33]

---

[29] See notes, 23, 24 and 25.

[30] FRUS, 1955-1957, Vol. VIII, p. 275.

[31] ibid, p. 299.

[32] ibid, p. 305.

[33] Letter from the President to the Secretary of State, dated 23 March 1955, FRUS 1955-1957, Vol. VIII, p. 278.

2. INDIAN FOREIGN AND SECURITY POLICIES UNDER NEHRU

Nehru's vision of a **'Greater India'** was instrumental in defining the aims and objectives of Indian foreign and security policies. The central edifice of these policies was the primacy of Indian national interests. India's territorial integrity and sovereignty, economic development, industrial progress, and adequate military strength for a great-power role were the primary objectives of these policies. These objectives were not different than that of any newly independent and under-developed state like India except the aspirations for a great-power role. India's geographic size and manpower potential was large enough to undertake that role. India formulated policies in pursuit of these objective and according to its perceptions of regional and international strategic environment. The main Indian policies formulated in the Nehru era were non-alignment, peaceful co-existence, and regional leadership. The salient feature of these policies are discussed in detail in the subsequent paragraphs and an appraisal is carried afterwards in section 3.

NON-ALIGNMENT

According to Nehru, Indian policy of non-alignment in essence meant that in order to realize his vision, he did not want India embroiled in cold-war politics which he believed would generate conflict and warfare.[34] He thought that non-alignment combined the twin objectives of peace and economic development.[35] Since then, different versions of non-alignment have been presented at official and academic levels. An official version which has been reiterated quite often

---

[34] Nehru, *INDIA'S FOREIGN POLICY: SELECT SPEECHES*, p. 2.

[35] *ibid*.

defines Indian non-alignment as: 'maintaining India's independence and freedom to take decisions on national and international questions on merits in each case without attaching ourselves to any ideological or military bloc'.[36] Many Indian and Western versions present non-alignment in different ways. Most Indian scholars are inclined to interpret non-alignment as an essential rationale for India's international outlook to attain maximum independence in the foreign policy-making process.[37] It is usually considered to be a policy of non-alignment with power-blocs. It is not seen in the negative sense of neutralism, but as an active, dynamic and positive assertion of independent judgement on all issues, taking each on its merit, but maintaining freedom of action and maneuver in international politics. However, Werner Levi's view that the Indian non-alignment developed into a 'comprehensive theory of international relations' is not only excessive but also untenable.[38]

Ashok Kapur's view of Indian non-alignment deserves consideration, not only for its merit, but also because his overall emphasis is on Indian nuclear policy rather than on non-alignment itself. In his view:[39]

> It is a strategy to become involved in global politics rather than to stay away from bloc conflicts. Second, non-alignment is a strategy to gain influence despite the condition of material weakness... In other words, it is a strategy to gain influence on the cheap; it is a low-risk strategy.

---

[36] Annual Report 1963-64: Ministry of Defence, Government of India, (New Delhi, GOI, 1964), p. 1.

[37] M.M. Rehman, *THE POLITICS OF NON-ALIGNMENT* (New Delhi, Associating Publishing House, 1969), p. 50.

[38] Werner Levi, 'Indian Neutralism Reconsidered', *Pacific Affairs*, Summer 1964, p. 142.

[39] Kapur, *INDIA'S NUCLEAR OPTION: ATOMIC DIPLOMACY AND DECISION MAKING*, pp. 56-57.

He infers that non-alignment does not avoid entanglement in great-power politics but avoids enrolment in formal alliance structures. It is a form of power-politics suitable to weaker states.[40] However, his differentiation between great power politics and power-politics looks superficial.[41]

In most Western interpretations, non-alignment is analysed within the context of cold-war bipolarity. Michael Brecher's description is quite apt, that it was an attempt to placate the growing intensity of cold-war politics and to create an environment of peace for India's economic development.[42] Non-alignment as a policy of equi-distance appears inadequate if judged against the actual conduct of Indian Foreign Policy, which always remained left of the centre in the East-West conflict. India's criticism of imperialism reflected an anti-Western tinge. A view of non-alignment as substitute for balance of power overlooks its inadequacy.[43] The theoretical substance of non-alignment in general and the specific Indian version do not provide a comprehensive analytical framework for the study of international behaviour of states as does the balance of power theory. On the other hand, the theory of balance of power provides a comprehensive framework for international analysis addressing the behaviour of all kinds of states in world politics.[44] Non-alignment is

---

[40] ibid, p. 58.

[41] ibid, pp. 58-59 and note 49 on p. 79.

[42] Michael Brecher, *THE NEW STATES OF ASIA: A POLITICAL ANALYSIS* (Oxford, Oxford University Press, 1963), pp. 111-122.

[43] Coral Bell, 'Non-Alignment and Power Balance', *Australian Outlook*, Vol. 17, August 1963.

[44] One of the best and comprehensive exposition of the theory of balance of power is provided in, Hans J. Morgenthou, *POLITICS AMONG NATIONS: THE STRUGGLE FOR POWER AND PEACE* (New York, Alfred A. Knopf, 1948), pp. 161-215.

deficient to offer an explanation of the complex interplay of international forces where dominant actors are great powers or superpowers. Nehru's policy of non-alignment was not a rejection of balance of power but a rejection of its underlying ideological conflict and the potentially dangerous arms race, both conventional and nuclear.

Officially, the United States viewed non-alignment not merely as a philosophical attitude but an approach that would best serve the national interests of the non-aligned states like India through an independent international policy.[45] However, within the cold-war politics, it was viewed as 'immoral' by Dulles. A less noted U.S. view of Indian non-alignment was expressed by President Eisenhower in the following words: 'we were better off with India following its policy of non-alignment than were she to join up actively on our side, with the consequent added burden on the American taxpayer and 2000 miles more of active frontier'.[46]

As a practical policy, non-alignment is not viable in cases where a militarily weaker non-aligned state is involved in a conflict with either of the great or superpowers without some form of protection from the later's adversary or bloc. Indian non-alignment virtually collapsed during and immediately after the 1962 Sino-Indian conflict. India had to seek military assistance from the Western bloc which Nehru had long criticized. The inadequacy of non-alignment prompted President Charles De Gaulle of France to remark on the Indian plight in 1962 that, 'When a country chooses to be non-aligned, it must proceed in belief that it is capable of

---

[45] Department of State, S/S-NSC File: Lot 63 D 351, NSC 5701 Memoranda dated 10 January, 1957, in FRUS 1955-1957, Vol. VIII, p. 30.

[46] Department of State, NEA/SOA, Central Files: Lot 62 D 43, India, June-December 1957, in FRUS 1955-1957, Vol. VIII, p. 348.

defending its frontiers without the aid of allies'.[47]

Indian non-alignment was formulated to maximize the independence of action in terms of foreign policy in the pursuit of Indian national interests. It was an attempt to escape from the East-West competition. In nutshell, it was a political strategy to pursue the Indian national interests which were perceived as endangered by the dynamics of the cold-war politics. Ultimately, it became an inevitable necessity for seeking financial and technological assistance from the industrially developed states for the economic revolution envisioned by Nehru. To a certain degree, Nehru successfully exploited the Soviet-American competition in favour of India in the pursuit of its national interests. In cases where Western countries failed to provide economic, industrial and technological assistance requested by the Indian government for specific projects, India invited and accepted support from the Soviet Union along with the carefully calculated risk of communist political penetration. The Soviet Union appeared eager to oblige in a bid to neutralize the Western influence in India and dissuade it from joining anti-Soviet military alliances. The West was equally obliged to respond favourably to the Indian requests for economic aid. Otherwise, India might accommodate the Soviet Union for financial and military assistance which it did in fact, despite Western support against China. So, non-alignment was aimed at creating a favourable international environment in the pursuit of Indian national interests, and seek economic and technological assistance from both the cold-war blocs. In this pursuit, India did not want to be entangled in the ideological conflict between East and West. India simultaneously followed the policy of peaceful co-existence with China which is discussed below.

---

[47] President Charles De Gaulle cited in Durga Das, *India: From Curzon to Nehru and After* (London, Collins, 1969), p. 31.

PEACEFUL CO-EXISTENCE

A consideration of non-alignment without bringing into focus the policy of peaceful co-existence cannot provide a complete view of Indian Foreign Policy. While non-alignment addressed issues generated by the East-West conflict, peaceful co-existence provided a framework for managing relations with the Soviet Union and China. Although, many interpretations have been derived from Nehru's statements on peaceful co-existence, its centremost argument was renunciation of the use of force in inter-state relations.[48] However, the concept and practice of peaceful co-existence is not an Indian idea. It is enshrined in the Charter of the United Nations as a fundamental principle of international relations. This principle had also provided the basis of the Briand-Kellog Pact for the 'Renunciation of War as an Instrument of National Policy'.[49] The philosophical base of Indian policy of peaceful co-existence appears a synthesis of principles of the U.N. Charter and the Gandhian concept of non-violence.[50] Nehru gave it a specific orientation and application suitable to Indian national interests. It was incorporated in the 1954 Sino-Indian Agreement in the form of *Panch Sheel* [five principles].[51]

Analysis of the broad context of *Panch Sheel* is

---

[48] Nehru, *INDIAN FOREIGN POLICY: SELECT SPEECHES*, pp. 40-50.

[49] The Treaty was signed at Paris on 27 August 1928; full details are provided in *Foreign Relations of United States, 1928*, Vol. I, p. 153.

[50] According to Raju Thomas, origin of the Indian policy of peaceful co-existence lays in the Bhudhist philosophy, Raju G.C. Thomas, *INDIAN SECURITY POLICY* (Princeton, New Jersey, Princeton University press, 1986), p. 14.

[51] See note 22.

beyond the scope of this study. However, some account of its Indian application would help to identify the overall orientation of Nehru's foreign policy. Indian policy of peaceful co-existence was Nehru's mechanism for managing Indian relations with the two giant communist states. Nehru must be credited with the foresight to visualize a great diversity of national and cultural outlook between the Soviet Union and China.[52] He visualized the potentiality of Sino-Soviet conflict despite their firm embrace to communism.[53] In 1952, he imagined before anybody else that the Sino-Soviet association would not possibly last more than a few years.[54] At that time, Western scholars were almost unanimous in their view of communism as a monolithic bloc. In Nehru's opinion, friendship with China was basic to the Soviet strategy in that period and the Soviets would pay any price to maintain it. But he thought that as China gained confidence, differences were bound to develop between them.[55] In his view, the Chinese had an old and deep-rooted philosophy, whereas the Soviets had a superficial culture which could not compete with China.[56] His observations appear quite realistic, except the conclusion he drew: 'there are more chances of China running Russia twenty years from this day than Russia running China'.[57]

Nehru was conscious of India's military weakness against China and the existence of a boundary dispute which could trigger a conflict. He therefore, opted for peaceful

---

[52] Department of State, Central File 791.00 MSP /7-1552, 23 July 1952.

[53] ibid.

[54] ibid, p. 3.

[55] ibid.

[56] ibid, pp. 3-4.

[57] ibid.

co-existence to safeguard his priority of economic development. He endeavoured to neutralize the possible emergence of a Chinese threat through political means, in order to avoid the economic cost of developing comparable military power at that stage. The formulation of this policy had no negative or sinister design, but was inspired by the ascendancy of a political approach at least in relation to the great powers. This approach was not adopted vis-a-vis India's small neighbours. Contrary to Indian claims, the policy of peaceful co-existence was based upon pragmatism rather than principle, superimposed by the belief that it was possible to maintain security through diplomacy alone. India could not afford to indulge in an arms race with China at that time. It had neither the requisite industrial and technological base, nor the economic strength to develop military power with its own resources in the immediate future. Nehru wanted at least 15 to 20 years of peace to develop Indian resources before it could play its due role in the world affairs.[58]

The policy of peaceful co-existence had broad support within India. Not only government circles but the opposition also supported the *Panch Sheel* as a basis of Sino-Indian relations. However, there was limited opposition within and outside the Lok Sabha. It was considered as appeasement of China implicit in the Sino-Indian Agreement of 29 April 1954 which endorsed China's sovereignty over Tibet.[59] Acharya Kripalani, leader of the Praja Socialist Party criticized the 1954 Agreement in the Lok Sabha as a 'surrender of Indian rights in Tibet'.[60] The Jan Sangh Party was equally critical of the Agreement and described it as 'Indian Government's policy

---

[58] Nehru, *INDIAN FOREIGN POLICY: SELECT SPEECHES*, p. 48.

[59] Lok Sabha Debates, 2nd Serial, Vol. 5, May 5-21, 1954, col. 7548.

[60] ibid.

of general acquiescence towards China'.[61]

Despite Nehru's efforts to manage the Sino-Indian relations on the basis of peaceful co-existence and avoid a conflict with China, one eventually took place in 1962. The policy of peaceful co-existence failed to achieve the objective for which it was formulated. However, the failure cannot be ascribed to the intrinsic merit of the policy but its application. Unlike non-alignment, there was nothing wrong with the theoretical substance of the policy of peaceful co-existence. The 1962 Sino-Indian conflict resulted from gross miscalculations in its application (see section 3).

REGIONAL LEADERSHIP

Since independence, regional leadership has emerged as a cardinal objective of Indian foreign and security policies, from the Nehru era until today. Indian behaviour in South Asia is that of a great-power. The objective of Indian regional leadership was not only implicit in Nehru's vision of 'Greater India', but explicit in policy statements and the actual conduct of Indian policies. Before and after independence, Nehru recurrently expressed his views about India's leading role in the region. Speaking in Bombay on 22 August 1946, he stated that, 'the Middle East, Middle West, Southeast Asia and China all impinge on India; all depend on India; economically, politically or for defence purposes'.[62] He continued that India was also pivotal for defence of the countries of Western Asia and therefore, it obviously had to be a

---

[61] Lok Sabha Debates, Vol. 18, August 1958, col. 1676.

[62] Cited in M. Venkatarangaiya, 'Indo-American Relations', in, *ASPECTS OF INDIA'S FOREIGN RELATIONS*, paper no. 2, (London, Indian Council of World Affairs, August 1949), p. 2.

central base for defence.[63] During a policy debate in the Constituent Assembly, Nehru impressed upon the members: 'remember that India, not because of any ambitions of her, but because of history and so many other things, has to play a very important part in Asia'.[64] He reiterated that view later: 'India will always make a difference to the world. Fate has marked us for big things. When we fall, we fall low, when we rise, we inevitably play our part in the world drama'.[65] This theme was continuously discernable from his statements on Indian foreign policy in South Asia. He believed that not only India's size was good enough for a leading role but the policies he adopted would ensure that status for India. Prophesying India's role in the region, he said,

> I am quite sure by adopting that position [Non-alignment], we shall ultimately gain national and international prestige... fairly soon... A large number of small nations will probably look to India more than to other countries for a lead.[66]

An often repeated Indian rationale which many Western scholars share with varying reservations, is that the role of a regional great-power is inherent in India's size and power potential, and therefore, a geo-strategic imperative of its foreign policy. That need not be disputed. But its logical inference is that Indian foreign policy behaviour in the South Asian region is inspired by a power-politics view, which India denied in the Nehru era. In fact, the British legacy added to Nehru's vision of **'Greater India'**, a security doctrine

---

[63] ibid.

[64] Constituent Assembly-Legislative Debates, Vol. 2, Part II, 8 March 1949, p. 1225.

[65] Dorothy Norman (ed.), *NEHRU: THE FIRST SIXTY YEARS, VOL. 1* (London, Bodley Head, 1965), p. 650.

[66] S.L. Poplai (ed.), *SELECTED DOCUMENTS ON ASIAN AFFAIRS: INDIA 1947-1950*, Vol. 2, (London, Oxford University Press for ICWA, 1959), p. 15.

identical to the Raj's Forward Defence Policy.[67] Post-independence Indian regional security policy was inspired by that legacy. According to Pran Chopra, 'By the compulsions of geography, the force of this example [British], and self-imagery of a "potential great-power", India made this strategic concept the foundation of its foreign policy, and so it remains until today'.[68] India always resisted, or at least strongly protested, against what it called a 'great-power intrusion' into its defence perimeters formerly covered by the Forward Defence Policy.

Nehru set the pattern of a limited use of force in the pursuit of perceived Indian national interests in the region. Immediately after independence, India used military force to take over the princely states of Junagadh and Hyderabad, which were given a right of accession to either India or Pakistan at the time of independence. India justified its use of force by explaining that the majority of people in those states were Hindus and wanted to accede to India against the wishes of their Muslim rulers who might had opted for Pakistan. On Kashmir, India applied a diametrically opposite criterion that the Maharajah of Kashmir, who was a Hindu, had the legitimate authority to accede to India, without regard to the wishes of the majority of the people who were Muslims. Chester Bowles, who had extremely close relations with Nehru, expected irritations in the Indo-US relations because of "Nehru's obstinacy on Kashmir".[69]

---

[67] A good description of the Forward Defence Policy is provided by Kavic, pp. 8-20.

[68] Pran Chopra, 'Change and Continuity in India's Foreign Policy,' an unpublished paper read at the Wilton Park Conference no. 329, organized by the British Foreign Office, November 21-25, 1988, p. 2.

[69] Department of State, Central File 791.00 MSP/7-1552, dated 23 July, p. 6.

Indian troops marched into the Portuguese colony of Goa in 1961 despite Portuguese recognition of the Indian claim on the colony and a willingness to vacate it after negotiations. Indian behaviour closely resembled with Argentina's adventure in the Falklands in 1982, except that it was not challenged through military response by Portugal. The U.S. President, John F. Kennedy remarked to Mr. B. K. Nehru, Indian Ambassador to Washington at the time. He said:

> I have not uttered a word, not a thing on Goa Mr. Ambassador. India could have taken over Goa fourteen years ago. It was yours. What you have done now, any self-respecting country would have done to assert its sovereignty. But you should not have preached us morality for fourteen years. You had no business to indulge in "holier than thou" attitude when you are just like any other nation. The reason why people are criticizing you is that they have seen a minister coming out of a brothel. They are happily clapping that he is like any other normal being.[70]

Kavic's observation corroborates this view: 'While urging other states to resolve disputes through negotiation, the Nehru administration resorted to force on a number of occasions to obtain its goals'.[71] To the outside world, Nehru behaved and appeared as the architect of non-alignment and peaceful co-existence. He never hesitated to criticize the great-powers whenever he thought their policies were impinging upon the tenets of Indian policies. But in the South Asian region, his own policies were in sharp contrast to what he demanded from the great-powers. There was an apparent contradiction.

---

[70] President John F. Kennedy's statement is quoted in Kuldip Nayyar, _INDIA IN THE CRITICAL YEARS_ (New Delhi, Offset Press, 1977), p. 145.

[71] Kavic, p. 3.

3. INDIAN POLICIES UNDER NEHRU: AN APPRAISAL

The two tiers of Indian foreign policy, i.e., non-alignment and peaceful co-existence nearly collapsed in the wake of 1962 Sino-Indian conflict when Nehru tried to apply the 'Forward Defence Policy' approach to its borders with China and it backfired. The defeat of the Indian Army was the result of a gross miscalculation by the Indian leadership who badly under-estimated China's political resolve and military capability to back-up its territorial claim by armed force. China's political (domestic) and economic weaknesses were misjudged as an inhibiting factor to undertake military operations against India. The Sino-Indian conflict was a classic case of misperception and misjudgment by India. The Indian leadership did not believe that large scale military operations were possible on the Himalayan border. The 1963-64 annual report of the Indian Ministry of Defence brings out that belief quite clearly. It said,

> The massive and unprovoked attack launched by China in October 1962 brought into focus the grave threat to the security of this country along a border major portions of which were traditionally considered most unsuited for military campaign.[72]

The Indian defence establishment and intelligence services equally failed to identify the large scale concentration of Chinese troops on the border. They could not make out a coherent picture of China's immediate military objective to attack India. This lack of appreciation was surprising in the light of the Indian government's view that the Chinese attack was pre-meditated. According to official Indian assessment: 'The nature and weight of the Chinese attack was such that it

---

[72] Annual Report 1963-64, MOD, GOI, p. 1.

could have been made only after long and careful planning'.[73]

Ambassador Bowles' view of Indian threat perceptions about China proved quite correct: 'Nehru and his associates were full of contradictions about China and had obviously confused their minds on the subject'.[74] Yaacov Vertzberger explains Nehru's frame of mind at that time. He observes, 'Nehru juxtaposed China's political, military and economic weakness against India's international political strength. Both politically and militarily, his judgement caused him to take unjustified risks'.[75] Nehru himself was quite candid in admitting not only the failure of his policies but his judgement.In a speech after the conflict, he stated: 'We were getting out of touch with reality in the modern world and were living in an artificial atmosphere of our own. We have been shocked out of it, all of us'.[76] According to Pran Chopra, Nehru suffered a loss of political vision as a result of the 1962 conflict.[77]

India's defeat in 1962 generated an intense debate within and outside the government. The Indian strategic community criticized the efficacy of political strategies such as non-alignment, peaceful co-existence, and the adequacy of India's military capability to safeguard Indian territorial integrity. As an immediate measure, the strength of the Indian

---

[73] Annual Report 1962-63, Ministry of Defence, Government of India, (New Delhi, GOI, 1963), p. 1.

[74] Department of State, Central File 791.00 MSP/ 7-1552.

[75] Yaacov Vertzberger, 'India's strategic Posture and the Border War Defeat of 1962: A Case Study in Miscalculation', *The Journal of Strategic Studies*, 5 (3), September 1982, p. 379.

[76] R. Nyrop and B. Benderly (ed.), *Area Handbook For India* (Washington, American University, 1975), p. 561.

[77] Personal Interview with Pran Chopra on 23 November 1988 at Wilton Park, England.

Army was increased on an emergency basis. Weapons and equipment were improved through major imports from abroad and with 'special assistance received from friendly foreign countries' and increasing domestic production.[78] In July 1963, India accepted an Anglo-American offer to hold joint air force exercises.[79] An official report conceded that, 'Our ideas of overall strategy as well as the requirements of weapons and equipment had to be reoriented'.[80] There were serious demands for the reappraisal and even abandonment of non-alignment. In an editorial comment, INDIAN EXPRESS echoed the public mood: "if alignment [means] a bit of sovereignty lost, non-alignment [means] a good bit of territory lost".[81]

It may be worthwhile to explore a body of opinions on the Indian behaviour in this context. It is neither desirable here to bring into focus the contentious issues which have become the root-cause of conflict between India and Pakistan nor intended to impute any sinister motives to the Indian approach. An extract from a report to the British government from Field Marshall Auckinleck, Supreme Commander of the British Indian Armed Forces, and Chairman of the Armed Forces Reconstitution Committee for India and Pakistan, explained Indian behaviour. He reported: 'I have no hesitation whatsoever in affirming that the present Indian Cabinet is implacably determined to do all in its power to prevent the establishment of the Dominion of Pakistan on a firm basis'.[82] In an editorial on Nehru's foreign policy, THE OBSERVER com-

---

[78] Annual Report 1962-63, MOD, GOI, p. 2.

[79] Thomas, p. 26.

[80] Annual Report 1963-64, MOD, GOI, p. 2.

[81] Cited by Levi, p. 140.

[82] John Connell, *AUCKINLECK* (London, Assell & Company Ltd., 1959), pp. 220-222.

mented: 'The Indian people often seen to have had a double standard, indignantly anti-imperialist abroad but quite ready to apply a little imperialism within their historic frontiers'.[83] In an assessment of Indian regional policy, Ian Stephen, observed: 'Whatever may be the outward semblance, a cardinal underlying purpose of Indian Foreign Policy was to keep her small neighbours weak and isolated for eventual reabsorption'.[84] These observations lend credibility to another opinion by Wayne A. Wilcox, who aptly described the duality of the Indian approach: 'To the world and world issues, India appeared the dove of peace. Within the region, she stood accused of power-politics'.[85] Similarly, THE IRISH INDEPENDENT wrote in 1962 that:

> On the subject of Kashmir, to which Pakistan has an arguable claim, Mr. Nehru refuses both a plebiscite and a conference. On Goa, where India has a good case if not a watertight one, he chooses the unilateral decision of military occupation. On the Chinese border dispute, where India is one hundred per cent in the right, he is ready to grasp at any straw to bring the aggressor to the negotiating table. It is difficult to avoid the conclusion that what Mr. Nehru has he holds, what he can obtain without trouble he takes, what has been taken from him by superior force he considers negotiable even when it is his in all justice.[86]

Nehru was a pragmatic statesman who sought national security through political strategies, e.g., non-alignment with the cold-war blocs and peaceful co-existence with China.

---

[83] THE OBSERVER, 4 November 1962.

[84] Ian Stephen, *PAKISTAN* (London, Ernest Benn Ltd., 1963), p. 267.

[85] Wayne A. Wilcox, *INDIA, PAKISTAN AND THE RISE OF CHINA* (New York, Walker and Company, 1964), pp. 38-39.

[86] THE IRISH INDEPENDENT (Dublin), 9 August 1962, cited by Kavic, p. 210.

He compensated India's relative military weakness against the great-powers through reliance on the policies of non-alignment and peaceful co-existence. India's economic, industrial and technological under-development in the 1950s and 1960s did not permit the pursuit of a great-power role beyond the South Asian region. However, Nehru relied on military power vis-a-vis India's small neighbours to establish its position as a regional great power. He did not hesitate to use force within the South Asian region to settle territorial disputes.

4. NEHRU ON NUCLEAR DISARMAMENT

Nehru was no doubt committed to peace and disarmament. He considered general and complete disarmament an essential instrument for the development of international peace and security.[87] He often spoke against the development of nuclear weapons by the great-powers as detrimental to international peace and security.[88] He launched a massive disarmament campaign to apply political pressure on nuclear weapon states. In July 1956, India presented far reaching proposals in the U.N. Disarmament Commission, which included: i) immediate cessation of nuclear explosions; ii) a ban on the production of fissionable material; iii) a ban on the transfer of fissionable materials from the civilian establishments to any military use by the nuclear weapon states; iv) an arrangement by the nuclear weapon states to dismantle their nuclear weapon stockpiles and make available the fissionable material contained in them for civilian purposes; and, v) a ban on the further spread of nuclear weapons.[89] India

---

[87] Jawaharlal Nehru, *JAWAHARLAL NEHRU'S SPEECHES: 1963-1964*, Vol. V, (New Delhi, GOI, 1968), pp. 202-05.

[88] *ibid*.

[89] *Disarmament Commission Document* DC/98, 31 July 1956.

continued to reiterate these proposals in many forms at various international forums. In 1956, under direct instructions from Nehru, the Indian government published a book which highlighted the devastating consequences of nuclear, thermonuclear and other weapons of mass destruction.[90] Its objective was to generate world-wide awareness about the horrible implications of the continuing nuclear arms race and the urgency to end it.[91]

India provided unqualified support for the negotiations on the Partial Test Ban Treaty (PTBT) and signed it on 8th August 1963, the day it was opened for signatures. Indian diplomacy during the PTBT negotiations suggested that it would accept that kind of arrangement. Nehru personally indicated that any partial treaty which did not rule out a comprehensive settlement of the nuclear disarmament issues but led to that direction would be acceptable to India.[92] However, India's role in the negotiations for the PTBT was limited by the fact that it was primarily settled between the two superpowers and the United Kingdom, outside the U.N. Disarmament framework.

Another compelling reason for Nehru to opt for disarmament was India's abject poverty and underdevelopment. Nehru's statement bears that out quite clearly when he said; 'It gives me pain to divert our resources for armament when there is so much to be done in the sphere of socio-economic development. Our socio-economic situation compels us to pursue disarmament'.[93] Disarmament might have appeared to Nehru as a

---

[90] _NUCLEAR EXPLOSIONS AND THEIR EFFECTS_ (New Delhi, GOI, 1956).

[91] _ibid_.

[92] Jawaharlal Nehru, _INDIA'S FOREIGN POLICY: SELECT SPEECHES_, p. 199.

[93] Nehru cited in J.P. Jain, _INDIA AND DISARMAMENT: AN ANALYTICAL STUDY_, (New Delhi, Radiant Publishers, 1974), pp. 4-5.

suitable course of action to improve the Indian military position in relation to the great powers. According to N.M. Ghatate, Indian interest in disarmament during the Nehru era 'though not publicly stated but evident' was the enhancement of its own stature in the power equation vis-a-vis the great powers because it would have stripped them of their instruments of power and thereby, reduced the power gap against India.[94] Leonard Beaton's view supports the above argument when he says that statesmen often use the language of 'disarmament rather than security' in the pursuit of their perceived national interests.[95] A similar assessment of Nehru's disarmament strategy by Kapur supplements the aforesaid contention. He noted, 'It appears that Nehru's strategy was to seek nuclear disarmament of the superpowers and the strategy up to the Test Ban reflected this approach. Yet in the 1950s, the policy revealed a dual orientation'.[96]

Nehru believed that no country was going to ban atomic weapons, 'unless it was certain that the other "colossus" would take similar steps'.[97] According to Bowles, Nehru stated to him in a private conversation that his [Nehru's] criticism of the United States was not over armaments because he felt they were necessary but 'at the fact that we spend too much time attempting to match the Russians in vituperation and

---

[94] Narayan M. Ghatate, _DISARMAMENT IN INDIA'S FOREIGN POLICY: 1947-65_, an unpublished Ph.D. thesis cited at length in Jain, pp. 5-6. Jain rejects the validity of Ghatate's argument because it assigns Machiavellian motives to Nehru and India.

[95] Leonard Beaton, _THE REFORM OF POWER_ (New York, Viking Press, 1972), p. 167.

[96] Ashok Kapur, 'India and the Atom', _Bulletin of the Atomic Scientists_, September 1974, p. 28.

[97] Department of State, Central Decimal File, 891.2546 /. 5-1154, 11 May 1954.

rancor'.[98] To some extent, it indicates a discrepancy between Nehru's public rhetoric on disarmament and what he believed as a realistic policy. Such an impression is also borne out from his speech in the Lok Sabha during a policy debate on nuclear disarmament and atomic energy. He stated:

> Hon. Members opposite and those on this side talked about banning these weapons [nuclear]. Well, we feel that we should ban or control all these terrible weapons. But it is not clear to me how our sentiments in this matter are going to result in that ban, or how a strong speech in this House can result in banning them. Ultimately, sometime or other, they will have to be controlled, if not put an end to. Well, from a good deal of what we know of this world, if one is all the time talking about banning this, who is to bell the cat.[99]

It is not intended here to discredit Nehru's support for disarmament which was beyond any doubt, but to suggest that his approach in its pursuit was pragmatic rather than idealistic. Nehru is generally misunderstood for his occasional rhetoric on the subject. It would be more appropriate to say that India sought nuclear disarmament as a policy instrument for the realization of an equitable international order. This view is reflected in a statement by a renowned Indian diplomat, V.C. Trivedi, when he said: 'Disarmament is not an end in itself but a means to an end, and the objective of a peaceful, progressive and just world is impossible of realization unless the world is first disarmed'.[100] However,

---

[98] Chester Bowles' Despatch to the State Department after his conversation with Nehru in July 1952, Department of State, Central File, 791.00/7-1552.

[99] Text of The Prime Minister's Speech on Uses of Atomic Energy, HOUSE OF THE PEOPLE (Lok Sabha), 10 May 1954, New Delhi, Press Information Bureau, GOI, p. 4.

[100] U.S. Arms Control and Disarmament Agency, *Documents on Disarmament: 1962*, Vol. II, (Washington, USGPO, 1962), pp. 1240-42.

Nehru categorically rejected unilateral nuclear disarmament for India.[101] His rejection of unilateral disarmament is not in contradiction with his support for general and complete disarmament. He believed nuclear disarmament as an integral part of general and complete disarmament.[102] However, his disarmament policy in the late 1950s clearly shifted from generalities to specific emphasis on China.[103] A more empirical assessment of Nehru's policy on conventional disarmament is provided by Kavic. He stated that,

> While lecturing the great powers on the evils of the armaments race, the Indian government during the period from 1947 to 1962 expended on defence a sum exceeding Rs. 3,000 crores (about $6,300 million), or between 21 to 46 percent of the current expenditure of Indian government.[104]

Nehru's support for disarmament was in line with the principle of international peace and security. He believed his policy of nuclear disarmament might dissuade the great-powers from piling up weapons of mass destruction which he considered a threat to international peace. In case of success, India would also gain significantly as it had nothing to disarm. Its power position would be enhanced thereby without investing large sums of money which it could not afford at that level. And finally, his campaign for disarmament built India's international image.

At the end, it is argued that there was no basis for Nehru to claim that India adhered to a unique approach to international politics, based upon politico-moral superiority

---

[101] Nehru, JAWAHARLAL NEHRU'S SPEECHES: 1963-64, pp. 204-05.

[102] ibid.

[103] ibid.

[104] Kavic, p. 4.

distinct from the traditional power-politics perspective. Nehru was a statesman of high calibre but his views lacked the finesse of a strategist. His policies of non-alignment from cold-war politics and peaceful co-existence were understandable. But the fact remains that ultimately he had to face the prospect of war with China, the very reason for which he devised the policy of peaceful co-existence. He criticized the West for their lack of appreciation about the 'ensuing Asian evolution' in general, and about China in particular. He himself proved seriously wrong on the perception of Chinese threat to India, and paid direly for it in 1962.

The Sino-Indian conflict of 1962 proved a watershed in regional and global politics. It gradually transformed the existing patterns of relations between regional and extra-regional powers into different security triangles which crystallized in the late 1960s. India immediately sought U. S. and Western military aid against China, particularly weapons suitable for high altitude air and ground defence. Soviet economic and military assistance to India also increased gradually. Both the superpowers tried to build India as an anti-Chinese bulwark for their own objectives. It brought into shape a confluence of U.S.- Soviet interests for some time. Nehru died on 27 May 1964 and could not witness the outcome of the post-1962 debate. In the wake of reappraisal, there was a shift of emphasis from primary reliance on security through political strategies towards the development of a credible force posture. Instead of economic development being the sole priority of the Indian government in the Nehru era, an increasing precedence was accorded to the development of military capability. Thereafter, security and development were recognized as two integral parts of national policy. However, the post-Nehru era reflected a preoccupation with the development of military power.

Chapter Three

INDIAN NUCLEAR STRATEGY IN THE NEHRU ERA: CREATING A NUCLEAR WEAPONS OPTION

This chapter deals with the political dimension of India's nuclear strategy and explores the rationale for the creation of a nuclear weapons option. It also examines the technical *modus operandi* adopted by India to develop its nuclear programme in a way that incorporated a built-in capacity for the development of a nuclear weapons option. This study suggests that Nehru, who was considered a staunch opponent of nuclear weapons, laid the technological foundation for a nuclear weapons option. It indicates the fallacy of the traditional view that Nehru's nuclear policy ruled out the possible development of nuclear weapons and entailed exclusively peaceful applications.[1] Nehru appears the architect of India's doctrine of nuclear ambiguity formulated to pursue a weapons course. It enabled India to escape the price of a declared weapons programme in an environment increasingly unfavourable to nuclear proliferation. Since independence, the objective of developing a nuclear weapons capability seems to have been pursued skillfully but without formal acknowledgement. Nehru rejected the application of international safeguards on the Indian nuclear programme through a coherent diplomacy which denied verification of the Indian claims that its programme had exclusively peaceful purposes. However, the gap between the evident form of India's developing nuclear weapons capability, and its public denials has gradually become so wide that it highlights the inherent contradictions. All these issues are examined in detail below in the light of the available evidence.

---

[1] Mirchandani, pp. 3-7, and Gupta, p. 1-8.

1. NEHRU'S POLICY OF NUCLEAR AMBIGUITY

As noted in the previous chapter, Nehru envisioned a **'Greater India'** and emphasized that the road to its rediscovery as a great-power led through industrial, scientific and economic development.[2] His vision predated independence. He hoped to harness the potential of nuclear energy for India's development and displayed remarkable foresight to pursue these objectives. Nehru's pre-independence views did not rule out the use of atomic energy for producing nuclear weapons. According to Kavic,

> Nehru informed a Bombay audience on 6 June 1946, if India was threatened she would "inevitably" try to defend herself by all means at her disposal <u>with the clear implication that such means did not exclude atomic bombs</u> (emphasis added).[3]

Nehru's statement reflects a broad view about the potential use of atomic energy and not a precise security declaration about Indian defence. It does not indicate whether India would first exhaust conventional means of defence and if those failed, it then had a right to use nuclear weapons. However, his pre-independence views were explicit and he did not rule out the development of nuclear weapons. Kavic notes another statement by Nehru in reply to a query as to whether the future GOI would have atomic bombs in its arsenal:

> Nehru stated his hope that India would develop atomic power for peaceful uses but warned that, so long as the world was constituted as it was, <u>every country would have to develop and use the latest scientific devices for its protection</u> (emphasis added).[4]

---

[2] Nehru, *THE DISCOVERY OF INDIA*, pp. 15-20 and 35-45.

[3] Kavic, p. 27. For similar views, also see Shyam Bhatia, *INDIA'S NUCLEAR BOMB* (New Delhi, Vikas, 1979), p. 71 and Norman, *NEHRU: THE FIRST SIXTY YEARS, VOL.11* p. 186.

[4] Kavic, pp. 27-28.

After independence, Nehru set on course to realize his vision of a 'Greater India'. He convened a meeting of the Atomic Energy Research Board on the 12th day after independence.[5] It demonstrated the high priority he assigned to the development of nuclear science and technology. In a policy debate on atomic energy in the Lok Sabha, Nehru told the House that nuclear power was more important for India than for any other country.[6] On another occasion, Nehru reiterated: 'India was determined not to be left behind the advance in the use of this new power'.[7] He seemed fascinated by the discovery of the atom and its potential for development. Nehru also had a deep understanding of Indian history and came to the conclusion that the fundamental cause of India's backwardness was its lack of scientific and indust-rial development. He held a deep conviction that India would not progress until it undertook the process of scientific and technological modernization.[8] He expressed the urgency of benefiting from the nuclear revolution which he believed was underway. Therefore, he was determined to pursue the development of nuclear power. Nehru's government introduced legislation on atomic energy within eight months of independence. It indicates the priority his government attached to the development of atomic energy. He spoke frequently on this subject. The following passage from his speech in the debate on the Atomic Energy Bill in the Constituent / legislative Assembly on 6 April 1948 reflects his mind:

---

[5] Nuclear India (Bombay, Department of Atomic Energy, Government of India), 5 (2), 5 January 1967, p. 3.

[6] Text of The Prime Minster's Speech on Uses of Atomic Energy, HOUSE OF THE PEOPLE, dated 10 May 1954, (New Delhi, Press Information Bureau, GOI, 1954), p. 6.

[7] Nehru, *JAWAHARLAL NEHRU'S SPEECHES*, Vol. III, (New Delhi, GOI, 1958), p. 435.

[8] ibid.

> Consider the past four hundred years of history. The world developed a new source of power, i.e. steam, and the industrial age came in. India with all its many virtues did not develop that source of power.It became a backward country and a slave country because of that. Now we are on the verge of atomic age. The point I shall like India to consider is that, if we are to remain abreast in the world as a nation that keeps ahead of things, we must develop this atomic energy quite apart from war. <u>Of course, if we are compelled as a nation to use it for other purposes, no pious sentiments of any one can stop the nation from using it that way</u> (emphasis added).[9]

It is evident from his statements at the time of independence that he favoured the development of nuclear energy primarily for scientific and industrial purposes but also endorsed its military application if it became imperative for national security. However, during the early phase of the Indian nuclear programme when India sought technological and financial assistance from the developed states, a different orientation was noticeable in Nehru's policy. He frequently spoke against the development of nuclear weapons by the great powers and seemed to reject their acquisition by India. On 20 January 1957, at the inauguration of ASPARA (India's first research reactor), he said,

> No man can prophesy the future. But I should like to say on behalf of my government, and I think I can say with some assurance on behalf any future government of India that whatever might happen, whatever the circumstances, we shall never use this atomic energy for <u>evil purposes</u> (emphasis added).[10]

Similarly in a policy debate in the Lok Sabha on 24 July 1957,

---

[9] <u>India: Constituent Assembly (Legislative Debates-Official Reports)</u>, Second Session, Vol. V (1), 6 April 1948, p. 3326.

[10] Nehru, <u>*JAWAHARLAL NEHRU'S SPEECHES*</u>, Vol. III, pp. 505-07.

he reiterated:

> In no event we will use atomic energy for destructive purposes. I am sure when I say this, I represent every member of this House. I hope it will be the policy of all future governments. The fact remains that if one has these fissionable materials, and if one has the resources, then one can make a bomb, unless the world is wise enough to come to some decision to stop the production of such bombs emphasis added).[11]

It is noteworthy that in all the statements on the use of nuclear energy made during the formative phase of the Indian nuclear programme, Nehru's assurances highlighted the Indian policy of not making nuclear weapons.[12] However, his choice of terms for those assurances needs careful scrutiny. It appears that Nehru was deliberately evasive and excluded the term 'military' from his assurances. He invariably preferred more ambiguous terms like "evil" and "destructive" in the context of the debate on the military versus peaceful uses of atomic energy. Otherwise, it is difficult to believe that a statesman of Nehru's stature was careless in the choice of such terms and was not conscious about the inherent incongruities. In an assessment of the 'Atomic Energy Development in India', the Scientific Adviser to the British government, Dr. H.R. Ambler, noted in January 1960 that,

> The unequivocal statement by the Prime Minister (Government of India press note of 16.12.59) that atomic energy would never be used for "evil purposes" means little, as self-defence would not be considered "evil".[13]

---

[11] Foreign Policy of India: Text of Documents, 1947-64, (New Delhi, Lok Sabha Secretariat, 1966), pp. 242-43.

[12] Emphasis is added by underlining the relevant terms.

[13] British Foreign Office Records, FO 371 / 149591, dated 23 January 1960 (London, Public Record Office, 1990).

Nehru was not willing to provide contractually binding obligations and instead chose to give vague assurances. Ashok Kapur has rationalized the Indian policy by saying: 'Implicit in the Indian approach was the view that peaceful and military uses of nuclear power were not simply antonymous concepts'.[14] In a more detailed assessment of the Indian nuclear decision-making process, Kapur further elaborated the point: 'a Western reader, familiar with his country's culture-bound analyses, is cautioned against assuming as a given that, since Nehru explicitly favoured civilian nuclear power, he favoured Indian nuclear weapons implicitly'.[15] However, Kapur questioned that, 'there was and is no legal definition of the term "peaceful use".[16] It indicates a line of thinking which amounts to hair-splitting legalism for justifying a weapons option within the framework of peaceful uses of nuclear energy.

Nehru's statements reveal three themes of Indian nuclear policy. First, he attached great importance to the development of nuclear energy for peaceful purposes. Second, India would not produce nuclear weapons. However, this theme lacked a deep-rooted commitment which appears as an integral part of the first. The third theme lies between the two and is based upon nuances highlighting equivocation and ambiguity. Each of Nehru's assurances about the peaceful uses of nuclear energy has a proviso, such as: 'India would defend itself by all means at her disposal', including the use of "latest scientific techniques for its protection"; 'if we are compelled as a nation to use it for other purposes, no pious sentiments of any one can stop the nation from using it that

---

[14] Ashok Kapur, 'India and the Atom', _Bulletin of the Atomic Scientists_, September 1974, pp. 27-28.

[15] Kapur, _INDIA'S NUCLEAR OPTION: ATOMIC DIPLOMACY AND DECISION MAKING_, p. 100.

[16] _ibid_. p. 110.

way' [military]; and 'unless the world is wise enough to stop producing such bombs' [nuclear].[17] Each of these provisos is an integral part of the assurances given against the non-peaceful uses of atomic energy. In fact, they render the assurances invalid, because these provisos are based upon extremely subjective evaluation. At times when Nehru sounded unequivocal, his assurances reflected an expression of hope rather than a clear statement of intent. Therefore, equivocation and ambiguity in Nehru's statements appear as deliberately intended to avoid binding commitments against the military use of atomic energy. Nehru had developed a clear perception of the potential role of nuclear technology for the future security of India and did not want to surrender that option.

Nehru's most trusted lieutenant on atomic energy matters, Dr. Homi Jehangir Bhabha, the architect of India's nuclear programme, was known to be a 'bomb man'. From the outset, he contemplated the use of nuclear energy for military purposes and subtly manoeuvred to develop the Indian nuclear programme along military lines. Bhabha expressed a firm conviction that, 'for the continuation of our civilization and its further development, atomic energy is not merely an aid: it is an absolute necessity'.[18] In 1948, he proclaimed that India would develop 'an atomic research centre comparable to those in the most advanced countries'.[19] The concept of PNE (peaceful nuclear explosion) had not developed in 1948 when Bhabha was made this statement. It had obvious military overtone. An Indian defence analyst, S.S. Khera believed that

---

[17] Please refer back to notes 3 to 11.

[18] Keesing's Contemporary Archives, Vol. 10, 6-13 August 1955, p. 14360.

[19] R. P. Kulkarni and V. Sharma, *HOMI J. BHABHA: FATHER OF INDIA'S NUCLEAR INDUSTRY* (Bombay, Popular Prakashan, 1969), p. 1.

Bhabha wanted to have 'everything ready for the bomb'.[20] Bhabha held a power-politics view of international affairs. Speaking at the Third International Conference on the Peaceful Uses of Atomic Energy, he stated: 'No form of power is as expensive as no power'.[21] He drove India towards the development of nuclear weapons.

Additional primary evidence of India's interest in nuclear explosions technology dates back to early 1954 when the idea of plowshares was embryonic, even in the leading nuclear power, the United States.[22] Declassified documents of the U.S. State Department reveal that India had an underlying interest in nuclear explosions as early as January 1954.[23] At that time Bhabha inquired from U.S. officials whether the U.S. Atomic Energy Commission and other concerned agencies would accept cooperation of the Indian Atomic Energy Commission in 'collecting observational data' on atomic explosions.[24] He further explored whether the U.S. AEC would like to enter into a cooperative arrangement with the Indian AEC or the Tata Institute of Fundamental Research to establish an installation in India, manned by Indian personnel, to record airborne fragments ejected by atomic explosions.[25] It is difficult to believe that Bhabha would have approached U.S. authorities on such a sensitive subject without seeking

---

[20] S. S. Khera, *INDIA'S DEFENCE PROBLEMS* (New Delhi, Orient Publishers, 1968), p. 317.

[21] J.P. Jain, *NUCLEAR INDIA, PART II* (New Delhi, Radiant Publishers, 1974), p. 153.

[22] The concept of plowshares was developed after the mid-1950s to explore the use of nuclear explosions for underground engineering and construction purposes.

[23] Department of State, Central Decimal File, 891.2546 / 1-2954, dated 29 January 1954.

[24] *ibid*.

[25] *ibid*.

permission from Nehru. It suggests strongly that Bhabha's attention was focussed upon gaining access to the technology associated with nuclear weapons.

It might not be unusual for Bhabha to make such a query from U.S. officials. India and the U.S. began close cooperation in the atomic energy field in 1950. As a part of its policy to eliminate trade between India and the communist bloc in strategic materials, and to assure adequate supplies of such materials for itself, the U.S. made a cooperative arrangement with the government of India on beryl and thorium nitrate. It entered into an agreement with India on 1st October 1950 to buy 25 percent of the Indian production of beryl ore for a period of 5 years, with an option for 5 year extensions.[26] A memorandum of commitment with regard to the purchase of thorium nitrate was concluded in 1954, and on 14 December 1955, the U.S. negotiated a contract with India to purchase 230 tons of that material.[27] India made a secret commitment not to supply these materials to any country in the communist Bloc.[28] The possibility of India's sale of these materials to China led the U.S. to a make pre-emptive purchase of the Indian production of the above nuclear materials.[29] This arrangement also took into account that Indian nuclear exports policy did not violate the provisions of the Battle Act, which required that all U.S. military, economic and financial assistance be terminated to any country trading embargoed strategic materials to the Soviet Union, its satellites and China.[30] India was therefore, allowed to receive U.S. finan-

---

[26] FRUS 1955-57, Vol. VIII, South Asia, p. 276.

[27] ibid.

[28] ibid, p. 294.

[29] FRUS, 1952-1954, Vol. XI, Part 2, pp. 1696.

[30] ibid.

cial, military and nuclear assistance. on the contrary, Nehru believed that, 'the offer of thorium and uranium by India to the United States had been an especially handsome gesture'.[31]

A close friend of Bhabha, Sir John Cockcroft recalled at a commemoration lecture after Bhabha's death that the later had become a central figure in discussions on the issue of India's acquisition of nuclear weapons.[32] He further disclosed that in his later years, at small closed meetings, Bhabha, 'appeared to be in favour of making bombs for a plowshares programme'.[33] Lord Blackett, who was also a close friend of Bhabha, confirmed the later's keenness for nuclear weapons.[34] In fact, Bhabha had eagerly announced to an informal meeting of the Consultative Committee of the Indian Parliament on Atomic Energy on 16 December 1959 that, "India is now in a position to manufacture atomic bombs and atomic weapons without depending on any outside help".[35] Retrospectively, it appears a rather tall claim in view of the state of India's nuclear development at that time.[36] The announcement might have been made for domestic political consumption.

Bhabha often opined that nuclear weapons were not prohibitive for India from an economic point of view because

---

[31] Department of State, Central Decimal File, 891.2546 / 2-2053, dated 20 February 1953, p. 2.

[32] Sir John Cockcroft and M. G. K. Menon, *HOMI JEHANGIR BHABHA: 1909-1966* (London, The Royal Institution of Great Britain, 1967), p. 15.

[33] ibid.

[34] Lord Blackett referred in, Bhatia, p. 114.

[35] Message from the Office of the High Commissioner for the United Kingdom, New Delhi, to Commonwealth Relations Office, TC. 66/5/5. British Foreign Office Records, FO 371 / 149591, dated 23 January 1960, (London, Public Record Office, 1990). Bhabha's announcement was reported by the newspapers.

[36] See end of the next section (2) of this chapter and Chapter Seven on India's Nuclear Weapons Capability.

of its large conventional military expenditure.[37] It was an additional reason for Bhabha to favour the development of nuclear weapons. In a meeting with John A. McCone, the Chairman of the United States AEC in September 1959, a Soviet atomic energy official, Professor V. S. Emelyanov, stated that Bhabha was interested in developing nuclear weapons.[38] He further noted that India could make weapons from the plutonium that could be produced in the natural uranium reactors Bhabha sought from the Soviet Union.[39] Emelyanov professed to have shown a lack of support for Bhabha's demand to acquire natural uranium, heavy-water nuclear reators from the Soviet Union.

Bhabha believed that the terms peaceful and military were value-laden, indistinguishable and referred to intent rather than technology.[40] The point he did not acknowledge was that intentions could be masked and a nuclear weapons programme could be advanced under a policy of ambiguity. Bhabha's choice for dual-purpose technologies indicates that he might be following such a course of action in the pursuit of a nuclear weapons capability. Therefore, one has to explore the development strategy and technological direction of the nuclear programme of a country such as India to assess the credibility of its claim about the peaceful versus military employment of nuclear energy.

---

[37] Bhatia, p. 4.

[38] MEMORANDUM FOR THE FILES OF JOHN A. McCONE, Office of the Chairman, United States Atomic Energy Commission, 2nd October 1959, p. 3, (Washington DC, National Security Archives, 1989). Professor Emelyanov later on served as Chairman of the Committee on Scientific Problems of Disarmament, the U.S.S.R. Academy of Sciences.

[39] ibid.

[40] Kapur, 'India and the Atom', pp. 27-28.

2. DEVELOPMENT STRATEGY FOR A NUCLEAR WEAPONS OPTION

Nehru and Bhabha demonstrated remarkable foresight by emphasizing the imperative of self-sufficiency as an essential feature of its nuclear development strategy. It was from the beginning, and remains, the central premise and fundamental objective of India's nuclear planning. It seems to originate from the realization that no long-term technical and financial support, commensurate with the political aims of the Indian nuclear programme, would be available if a weapons option was openly proclaimed. Development strategy also took into account the fact that India had limited sources of uranium, but very vast reserves of thorium.[41] In view of these considerations, Bhabha worked out complete policy blueprint for the Indian nuclear programme in 1954 and the guidelines for its implementation. His plan envisaged a three stage development strategy that remains effective until today.[42]

At the first stage, it was decided to install the pressurized heavy water (PHW), natural uranium reactors because of their convenient availability, technical suitability and economic feasibility in the early phase of its nuclear development.[43] The choice of this system took into account the fact that natural uranium was easily available and India could fabricate it in a short period of time.[44] More importantly, while generating electric power for different

---

[41] See Chapter Seven, section 2.e. on Nuclear Fuel, pp. 287-89.

[42] NUCLEAR ENERGY PROGRAM-INDIA (U), The U.S. Defense Intelligence Agency, Directorate for Scientific and Technical Intelligence, No. ST-CS-02-268-74, dated 1 July 1974, pp. 2-3. (Washington DC, National Security Archives, 1989).

[43] *Nuclear India*, 24 (2), 1985, p. 2.

[44] ibid.

agro-industrial purposes, the PHW reactors would produce plutonium as a by-product, which after reprocessing, is a weapons-grade material. So, the civilian and military uses of nuclear power were indivisibly integrated by opting for dual-purpose technologies and denying the verification of its potential military use by refusing to allow the application of international safeguards.

Second stage of the development strategy was based upon the plan to utilize the plutonium recovered as a by-product from the operation of PHW reactors through recycling it as a fuel.[45] This entailed the development of plutonium reprocessing plants. Reprocessed plutonium would then be used as a fuel in the fast breeder reactors (FBR) and it would simultaneously irradiate thorium to produce fissile Uranium-233 (U-233).[46] So far, India has only been able to design, construct and operate a fast breeder test reactor (FBTR) at its Reactor Research Centre (IGCAR) at Kalpakkam, three decades after the development strategy was planned.[47] The FBTR achieved criticality on 18 October 1985 and soon ran into difficulties but the DAE authorities expressed confidence that it could be restarted with an expanded core.[48] It would take a long time before India could construct and install commercial scale fast breeder rectors. Simultaneously, India needed reprocessing plants to purify plutonium from the radioactive waste recovered from the PHW reactors for use in the FBRs at the second stage (1980s). However, India actually completed the construction of its first reprocessing plant in 1964 at Trombay when it had not installed even a single PHW power

---

[45] ibid. pp. 2-3.

[46] ibid.

[47] Annual Report 1986-1987: Department of Atomic Energy (Bombay, GOI, 1987), p. 2.

[48] ibid.

reactor from which it could reprocess the by-product, (except CIRUS).[49] The first use of plutonium, recovered from CIRUS reactor and reprocessed at the Trombay plant, was for carrying out the 1974 nuclear test.[50]

The third stage of the development strategy envisaged the use of U-233 as a fuel in the FBR thermal reactors, an element which would be produced in abundance during the operation and implementation of the second stage. Uranium-233 fueled reactors, while generating electric power, would breed more Uranium-233 than they would consume through the irradiation of thorium.[51] India has the world's largest reserves of thorium.[52] Indian atomic energy officials claim to have perfected the technology to convert thorium into U-233 in the mid 1970s.[53] A U-233 fuelled research reactor, KAMINI, designed at BARC, is reported to be near completion at Kalpakkam.[54] The successful completion of the third stage will ultimately shift the focus of India's nuclear programme on thermal reactors fuelled by U-233 which would be abundantly available from Indian reserves of thorium.

The PHW reactor system is now fully indigenous in terms of construction and operation of nuclear power stations, although the basic design is of Canadian origin. Bhabha realized that uranium enrichment was beyond India's technological and financial capacity at the first stage and would

---

[49] See pp. 74-81 below for details about CIRUS reactor.

[50] A detailed discussion of the 1974 Indian nuclear test is provided in Chapter Four, section 5.

[51] NUCLEAR ENERGY PROGRAM-INDIA (U), Defense Intelligence Agency, p. 3.

[52] ibid. p. 15.

[53] Annual Report 1986-1987: Department of Atomic Energy, p. 5.

[54] ibid.

have caused significant delays in the Indian nuclear programme. Importing enriched uranium, like the Tarapur reactors (the only exception in its nuclear programme, acquired from the U.S. because it offered specially favourable terms), entailed the prospects of accepting international safeguards which India opposed. The Indian scientific community believes that the difficulties developed in the case of Tarapur reactors vindicates the efficacy of their development strategy.[55]

The formulation of this strategy has made available large quantities of plutonium to India from the operation of PHW reactors at the first stage. While plutonium is considered essential for the conversion of thorium into U-233 at the second and third stages of the Indian nuclear programme, it is also a weapons-grade material after reprocessing. So, the development strategy was formulated by keeping in mind the dual-track function of the Indian nuclear programme, i.e. to generate nuclear power for a wide range of civilian purposes and to provide weapons-grade material for a nuclear option with a routine civilian justification. It also helped avoid undue alarms which could have been raised about Indian nuclear military objectives in the early phase of the programme.

The PHW reactors at Kalpakkam and Narora are free from safeguards and form the basis of India's weapons-grade plutonium.[56] The development strategy was devised to provide an indigenous foundation so that a weapons option would not get scuttled once it became evident. In addition, to fully utilize the indigenous reserves of thorium for the development of Indian nuclear capability, India seems to have foreseen the technological problems when it wanted to pursue

---

[55] *Nuclear India*, Vol. 24 (2), 1985, pp. 2-3.

[56] NUCLEAR ENERGY PROGRAM-INDIA (U), Defense Intelligence Agency, p. xii. Also see Chapter Seven on the Indian nuclear weapons capability.

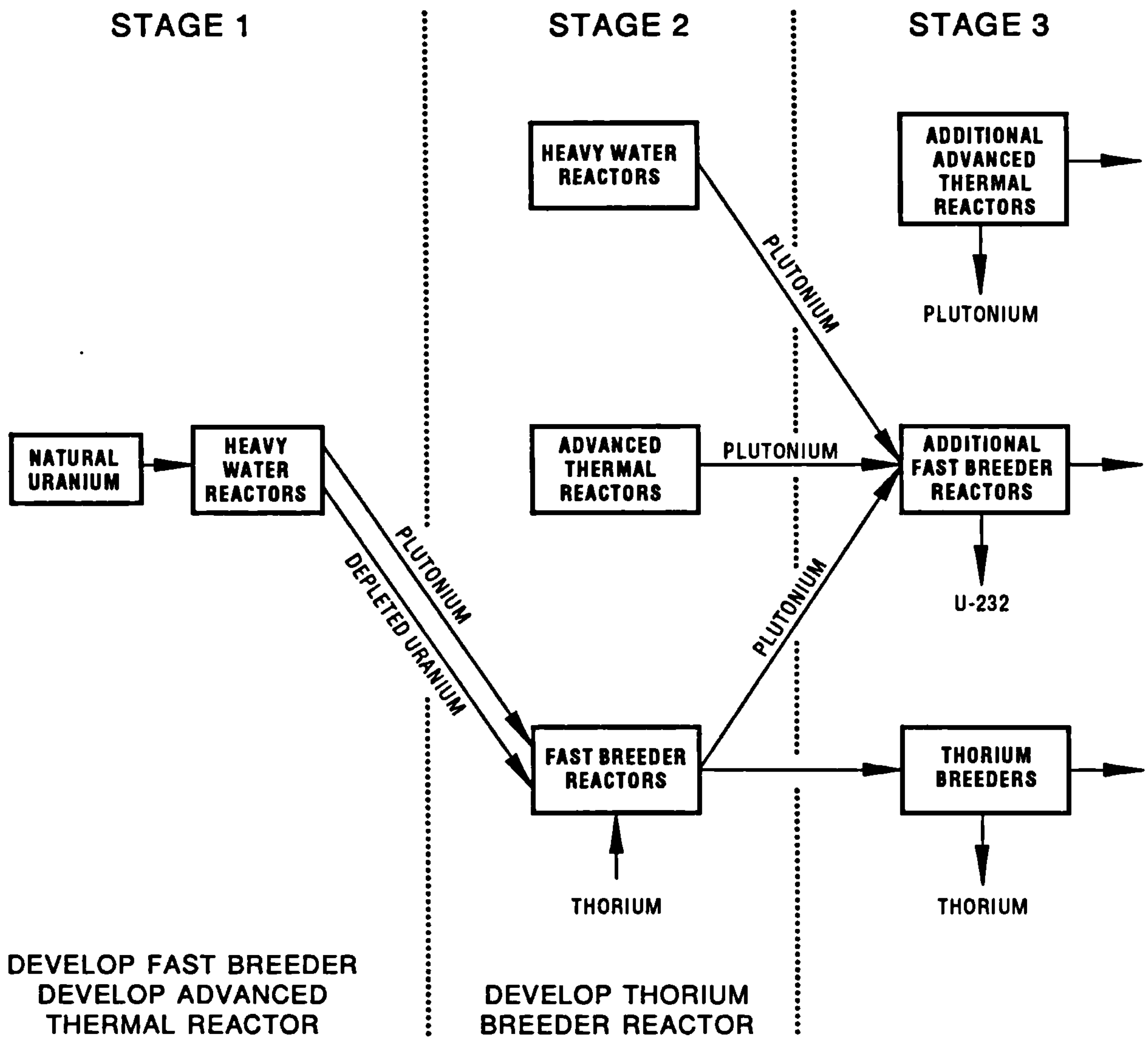
a nuclear weapons capability. The development strategy took into account the problem of freeing India from reliance on foreign supplies and the attendant politico-economic pressures at the time when India might opt for a public nuclear force. Bhabha had conceived and designed a nuclear weapons option within the civilian structure in a way that the weapons capability would expand automatically with the development of the civilian nuclear programme. The two other important considerations for the choice of this strategy were: acquisition of nuclear technology from abroad which could not be developed locally; and its gradual indigenous development to save the Indian nuclear programme from the application of international safeguards so that potential military employment could not be verified. According to Kapur, Nehru wrote a note on Bhabha's memo which read, 'somewhat as follows: "Apart from building power stations and developing electricity, there is always a built-in advantage of 'defence use' if the need should arise".[57] It indicates the priority attached to a nuclear weapons option which was pursued at the same time while planning for the generation of nuclear power in the Nehru era. Since a nuclear weapons option was designed within the framework of the civilian nuclear power programme, it would automatically expand with the growth of the power programme.

The technical design and lay out of the development strategy designed in the Nehru era is provided in figure-I on the next page to illustrate its full application, covering all the three stages of the Indian nuclear programme. It is effective until today and caters for the future expansion of the power programme as well as the weapons capability.

---

[57] Kapur, INDIA'S NUCLEAR OPTION: ATOMIC DIPLOMACY AND DECISION MAKING, pp. 193-94. Kapur's information is based on confidential interview in New Delhi and he does not cite a public evidence in this case.

INDIAN NUCLEAR PROGRAMME: DEVELOPMENT STRATEGY



Source: Nuclear Energy Program-(U), The U.S. Defence Intelligence Agency, Directorate of Scientific and Technical Intelligence, No. SC-CS-02-268-74, dated 1 July 1974, p.2 (Washington DC, National Security Archives, 1989).

The technological evidence suggests that the direction of the Indian nuclear programme under Nehru was contrary to his professions of "peaceful uses only". His government accorded special priority to the establishment of two nuclear facilities, the CIRUS Reactor and the Trombay Reprocessing Plant. Both the facilities had an immediate military oriented potential and could be employed for civil use only after a long time when the related facilities for their use could be ready.[58] The construction work on CIRUS started in 1956, and the Trombay Reprocessing Plant in 1961.[59] Both the facilities were pivotal for carrying out the Indian nuclear test in 1974. CIRUS was commissioned on 10 July 1960 for which Canada provided the complete design, equipment and assistance in installation under an agreement signed in April 1956.[60] It is a natural uranium-fuelled, 40 MW (e) research-cum-power reactor, with a capacity to produce 9.4 k.g. plutonium per year.[61] Although the agreement did not contain inspection provisions, it explicitly stated that CIRUS would be used for 'only peaceful purposes'.[62] Canada also agreed to supply fuel for the reactor.

When Canada supplied only one half of the loading

---

[58] See pp. 68 -73 above.

[59] BHABHA ATOMIC RESEARCH CENTRE, Department of Atomic Energy, (Bombay, GOI, 1985), see section, MILESTONES.

[60] RESEARCH REACTORS AT TROMBAY, (Trombay-Bombay, BARC - DAE, GOI, 1987), Document No. 400 085, July 1987. Details are also available in Annual Report 1960-61: Department of Atomic energy (Bombay, GOI, 1961), pp. 64-66.

[61] ANALYSIS OF SIX ISSUES ABOUT NUCLEAR CAPABILITIES OF INDIA, IRAQ, LIBYA AND PAKISTAN, Subcommittee on Arms Control, Oceans, International Operations and Environment; Committee on Foreign Relations, United States Senate, 97th Congress, 1st Session (Washington, U.S. Government Printing Office, 1982), p. 2.

[62] ibid.

of the first core of fuel, India substituted it with locally fabricated (Indian) uranium.[63] The Indian justification to load their own fuel, which was not originally programmed, was based upon the plea that the Canadian fuel was low-grade.[64] On the contrary, the above noted U.S. source suggests: 'they [Indians] may have wanted to get the Canadian fuel and the attendant safeguards out of the way as soon as possible'.[65] Under the apprehensions that India might misuse the facility for non-peaceful purposes, Canada insisted and obtained the right to inspect the Canadian supplied fuel.[66] India did not agree on the inspection for the fuel of Indian origin because it was not within the terms of the agreement. Canada did not object to the Indian view. Most probably, Canada might have felt assured by Nehru's ambiguous pledges and did not ask for the application of rigid inspection provisions. The international environment at that time (1950s) did permit such a latitude because general apprehensions about the proliferation of nuclear weapons were not yet profound. The technologically advanced countries such as Canada and the U.S. were liberal to provide nuclear technology to the underdeveloped countries like India. In fact, India was the principal beneficiary.

The U.S. provided heavy-water for the CIRUS reactor on the undertaking that it would be used exclusively for peaceful purposes.[67] Like Canada, the U.S. too did not insist

[63] 'India Reactor Inspection [Canadian Inspections of CANDU Reactor],' Memorandum of the Joint Committee on Atomic Energy, U.S. AEC, 3 November 1965 (Washington DC, National Security Archives, 1989).

[64] ibid.

[65] ibid, p. 2.

[66] ibid.

[67] *CONGRESSIONAL RECORD*, 30 August 1976, p. S14919.

on inspection provisions. According to the U.S. Central Intelligence agency (CIA), the CIRUS reactor had been 'operated in a manner which favours the output of plutonium suitable for weapons'.[68] Although there could be civilian uses of that fissile material for R & D, the Indian nuclear programme was not advanced enough to use it. It has also been established that the U.S.- supplied heavy water was in use in the CIRUS reactor during the period in which India recovered the plutonium for its 1974 nuclear test, something it then denied.[69]

India's first plutonium reprocessing plant capable of producing weapons-grade material was designed and completed in the Nehru era. Design work for the plant began in the late 1950s on the basis of information declassified by the U.S. Government. According to a report in THE WASHINGTON POST, the U.S. Government was not only aware of the Indian plan to construct the plant but also provided 'some training assistance to the Indian nationals in this regard'.[70] At that time, the reprocessing facilities, which also have civilian uses, were not seen by the U.S. Government as a proliferation problem. According to the above report, the documents released by the U.S. AEC after the Indian nuclear explosion in 1974 stated that VITRO International, a subsidiary of VITRO CORPS, contributed to the design of the reprocessing plant without permission from the U.S. government.[71] According to the DAE

---

[68] Memoranda for Mr. Charles E. Johnson, Staff Member NSC, from Donald F. Chamberlain, Director of Scientific Intelligence: Subject; The Indian Nuclear Weapons Capability, Central Intelligence Agency, SC No. 11794 / 65, dated 18 October 1965, p. 3 Lyndon, B. Johnson Library, Texas.

[69] *CONGRESSIONAL RECORD*, p. S14919.

[70] Don Oberdorfer, 'U.S. Training Aid in Indian A-Blast Cited', THE WASHINGTON POST, 19 July 1976, p. A1.

[71] ibid.

sources, the construction of the plant started on 27 March 1961 at BARC, Trombay.[72] The U.S. AEC demanded details from VITRO International during the final stages of construction of the plant in January 1963 but the firm refused, allegedly under direction from Indian Atomic Energy officials.[73] There is no evidence of further follow-up. It does not seem likely that the U.S. government had any objections to the construction of the plant but they might have been interested in its details. According to the report, U.S. AEC memoranda suggest that various U.S. agencies also agreed to sponsor and finance training facilities for Indian officials at the U.S. AEC production works at Hanford in the plutonium recycling process leading to the making of weapons-grade materials and reusable fuels.[74]

India also acquired the services of Dr. G.A. Welch from the U.K. Atomic Energy Authority under a Technical Cooperation Scheme of the Colombo plan.[75] The plant was likely to go into operation in early 1963 at the cost of Rs. 3.7 crores (£ 2,750,000).[76] It began initial test runs in March 1964 (about three months before Nehru's death), and by october 1964, the first run using irradiated fuel from CIRUS had been completed.[77] The plant was formally inaugurated after Nehru's

---

[72] BHABHA ATOMIC RESEARCH CENTRE, see section, MILESTONES.

[73] Don Oberdorfer, p. A1.

[74] ibid.

[75] Beaton and Maddox, pp. 139-40. For information on Colombo Plan see note 106 below.

[76] ibid.

[77] Memoranda for Mr. Charles E. Johnson, Staff Member NSC, from Donald F. Chamberlain, Director of Scientific Intelligence, p. 2.

death by P.M. Shastri on 22 1965 January.[78] The plant is safeguards-free and was established with unusual speed and urgency, despite the fact that India had no civilian facility for the use of plutonium for the next three decades. Theoretically, plutonium was important for India's three stage nuclear developmental strategy. In practice, India's fast breeder reactor programme, for which plutonium was needed has not been underway until today except the test reactor (FBTR).[79] No other atomic energy facility was accorded such a top priority as the reprocessing plant. From then onward, it was believed on the basis of technical evidence that, 'India is now in a position to proceed with a nuclear weapons research and development program at minimum cost and delay'.[80]

The unusual urgency and secrecy with which the work on these facilities began aroused suspicions about India's nuclear objective. According to Dr. Ambler, 'U.K. A.E.A. Headquarters in London did mention to me that there was some reason to believe that India was developing nuclear weapons and said they would be glad if I would let them know any relevant facts I might come across'.[81] Dr. Ambler met Dr. Welch at Trombay many times but did not ask him 'any leading questions' in order to avoid embarrassment for him.[82] Dr. Welch did say to Ambler that, 'if anything of this kind were afoot he would not be told about it and he could only form opinions by putting two and two together'.[83] This was the time when

---

[78] BHABHA ATOMIC RESEARCH CENTRE, see section, MILESTONES.

[79] See pp. 70 to 73 above.

[80] See note 68 above.

[81] British Foreign Office Records, FO 371 / 149591, p. 1.

[82] ibid.

[83] ibid, pp. 1-2.

Bhabha had announced to the Consultative Committee of the Indian Parliament that India could produce nuclear weapons without any foreign assistance.[84] These developments indicate that Nehru and Bhabha were on course to pursue a nuclear weapons option. The amount of expenditure incurred on the nuclear development programme is yet another indicator of their military oriented motives. According to a U.S. study, India spent around $ 220 million on its nuclear development from 1954 to 1964 and an additional $30-40 million were thought enough for the production of a 'crude low-yield plutonium device'.[85] It suggests that a nuclear option was realized in the Nehru era, earlier than the facilities for the peaceful uses of atomic energy. Therefore, technological determinism indicates a weapons oriented direction in addition to the peaceful uses of atomic energy. The Indian claim of an exclusively peaceful use of its nuclear programme in the Nehru era is untenable.

After the 1962 conflict, Bhabha became vocal in favour of India's development of a nuclear deterrent against China. In his oft-quoted paper read at the 12th Pugwash Conference on Science and World Affairs in January 1964, he suggested 'recourse to nuclear weapons to redress the imbalance' against China's military dominance.[86] He stated that nuclear weapons alone could enable a relatively weaker state to acquire 'what we may call a position of absolute deterrence even against another having many times greater destruc-

---

[84] See note 35, pp. 67-68 above.

[85] BACKGROUND PAPER ON FACTORS WHICH COULD INFLUENCE NATIONAL DECISIONS CONCERNING ACQUISITION OF NUCLEAR WEAPONS (Sanitized); December 1964, NATIONAL SECURITY FILE, Committee File - Committee on Nuclear Proliferation, India (Box 1), Lyndon B. Johnson Library, Texas, p. 4.

[86] Homi J. Bhabha, 'Safeguards and Dissemination of Military power' *Disarmament and Arms Control*, Autumn 1964, pp. 433-40.

tive power under its control'.[87] He further stated that the opponent's overkill capability did not matter if one possessed nuclear weapons oneself.[88] Bhabha accepted the value of a nuclear security guarantee in principle but did not consider it adequate for India's specific position, and preferred an independent nuclear deterrent.[89] He stated that the economic cost of Indian nuclear deterrent would be small if spread over a period of 10 to 15 years.[90] Although personal preferences of policy-makers should not be overrated in ascertaining government policy intent, Bhabha's inclinations assume significance when viewed in the light of the ambiguity pervading the Indian nuclear policy. Moreover, Bhabha's statement was made when Nehru was in power and there was no repudiation of Bhabha's views by the government.

Beaton and Maddox's skepticism about Nehru's nuclear policy of "only peaceful uses" is noteworthy. It originates from the two trends in the Indian nuclear programme. They point out that the significance attached to the achievement of self-sufficiency in all the nuclear technologies and consistent opposition to the application of International safeguards suggest, 'an anxiety to have the option on producing a bomb'.[91] They further state that the Indian atomic energy programme proceeded urgently at a heavy cost despite scarce resources and therefore, conclude that, 'The most reasonable inference is that Mr. Nehru, advised by Bhabha, has decided to give the country the option to produce a nuclear device in 1963 in case it should become politically or militarily

---

[87] ibid.

[88] ibid. pp. 435-37.

[89] ibid.

[90] ibid.

[91] Beaton and Maddox, p. 136.

necessary'.[92] Kapur's observation that, 'Prime Minister Jawaharlal Nehru had sanctioned work towards a PNE development before his death' appears logical, although he does not offer conclusive evidence.[93] The foregoing indicates that Nehru and Bhabha were not only on course to develop a nuclear weapons option, but the option was in fact realized by the completion of two safeguards-free dual-purpose facilities, CIRUS reactor and Trombay Reprocessing Plant.

3. NEHRU'S NUCLEAR DIPLOMACY

Since independence, India has stayed in the forefront of nuclear diplomacy within and outside the United Nations. It has consistently projected itself as a champion of general and complete disarmament at international forums, but has denied its application in any form to India so long as the great powers demur. As seen in Chapter two, it has consistently rejected unilateral nuclear disarmament. India presents an image through a coherent nuclear diplomacy that it not only supports the principles of disarmament and non-proliferation of nuclear weapons, but is among the architects of these principles. Yet, as will be discussed in the subsequent paragraphs, India in practice undermines the application of those principles when it comes to modalities in which they are to be applied.

India's first noteworthy position on international safeguards against nuclear proliferation was its rejection of Baruch Plan. The plan proposed the establishment of an International Atomic Development Authority (IADA) to supervise the atomic energy activities which were considered potentially

---

[92] ibid, p. 141.

[93] Kapur, *International Nuclear Proliferation: Multilateral Diplomacy and Regional Aspects*, p. 184.

dangerous to international security.[94] Since then, India has opposed the imposition of any form of international safeguards which might inhibit the development of its safeguards-free nuclear programme unless they were applied universally and without discrimination. Nehru stated explicitly that India would only accept international safeguards: 'provided we are assured that it is for the common good of the world and not exercised in a partial way, not dominated over by certain countries, however good their intentions might be'.[95] He expressed serious doubts about the nature, purpose and format of the agency proposed in the U.S. President Eisenhower's "Atoms for Peace" proposal presented in the U.N. General Assembly on 8 December 1953 and saw it as a deliberate move to control the strategic raw materials of developing states, like India. A close scrutiny of the Eisenhower proposal and Nehru's response to that bears out an impression that Nehru had an apprehensive attitude regarding that proposal. President Eisenhower proposed that,

> The Governments principally involved, to the extent permitted by elementary prudence, to begin now and continue to make joint contributions from their stockpiles of normal uranium and fissionable materials to an International Atomic Energy Agency. We would expect that such an agency would be set up under the aegis of the United Nations. The Atomic Energy Agency could be made responsible for the impounding, storage and protection of the contributed fissionable and other materials.[96]

Nehru responded to the Eisenhower's proposal in a

---

[94] Documents on Disarmament: 1945-59, (Washington DC, Department of State, 1960), p. 7.

[95] India: Parliamentary Debates-Official Reports, Lok Sabha, Sixth Session, 10 May 1954, Col. 7038.

[96] Text of The Address Delivered By The President of The United States Before The General Assembly of The United Nations, 8 December 1953, pp. 7-8.

detailed analysis during a policy debate in the Lok Sabha on the uses of atomic energy. He said,

> President Eisenhower's speech was, if I may say so with all respect, a fine speech, with generous sentiments and with a proposal which deserves our attention. But the proposal was a vague proposal; it is a vague indication of which way one should look; not exactly a specific proposal.[97]

After this brief and guarded appreciation, Nehru did not restrain for long his apprehension about the concept of an atomic energy agency which might exercise some form of control in the field of atomic energy. He expressed his sensitivity by saying that,

> It is probably a loose talk, this talk of control. Who is to control it internationally?... President Eisenhower refers to some agency of the United Nations..."An international control agency shall be set up by the United Nations. It shall here after be an independent body outside the control of the Security Council and of the United Nations".[98]

Nehru quoted at length from an earlier U.N. proposal on the subject and attempted to establish a linkage between the U.N. and the Eisenhower proposals. He thought it might ultimately result in an international control on atomic energy and associated materials of the developing countries. His misgivings about the nature and scope of the proposed agency are reflected from his view:

> This is a far-reaching provision, namely, that all our raw materials and our mines would be owned and controlled by that independent body, which is even independent of the United Nations after it is created.[99]

---

[97] Text of The Prime Minister's Speech on the Uses of Atomic Energy, dated 10 May 1954, p. 3.

[98] ibid. pp. 7-8.

[99] ibid. p. 9.

Nehru believed that it was undesirable for a country like India that the great-powers should control its atomic programme and raw materials. He said, 'I submit it would not be right to agree to any plan which hands over even our raw materials and mines, etc. to any external authority.'[100] In his concern against any probable control on India's atomic raw materials, Nehru disregarded a part of the Eisenhower proposal where it stated that, 'the proposal has a great virtue that it can be undertaken without irritations and mutual suspicions incident to any attempt to set up a completely acceptable system of world-wide inspection and control'.[101] As a follow-up to the proposal, the U.S. AEC requested President Eisenhower to approve an allocation of 20,000 kilograms of U-235 for distribution to other countries under Section 41 of the Atomic Energy Act of 1954.[102] After the approval, the U.S. AEC distributed that material to other countries. It offered to donate additional 1,000 kg (U-235) to the IAEA when duly established.[103]

It is noteworthy that amongst developing countries, India was the first beneficiary from the Eisenhower's "Atoms For peace Proposal" not only on a unilateral basis from the U.S., but also internationally. In February 1955, the U.S. AEC granted an Indian request for ten tons of heavy water for use

---

[100] ibid. pp. 10-11.

[101] Text of The Address delivered by the President of the United States at the United Nations, 8 December 1953, p. 8.

[102] Memorandum from Lewis Strauss, Chairman, United States Atomic Energy Commission to the President, the U.S. AEC, dated 20 Feb 1956.

[103] Memorandum from lewis Strauss, Chairman, United States Atomic Energy Commission, to Herbert Hoover Jr., Under Secretary of State the U.S. AEC, dated 31 May 1956.

in a research reactor (CIR).[104] India's gratitude to the U.S. for the provision of heavy-water was acknowledged by renaming that reactor from CIR (Canada-India Reactor) to CIRUS (Canada-India-US) Reactor. The U.S. AEC Chairman, Lewis Strauss, explained the U.S. decision:

> I hope the sale of this heavy water to India is only a first important step in a broader collaboration in this field. It is in keeping with the program of the United States in developing arrangements with friendly nations to promote the peaceful uses of atomic energy as announced by President Eisenhower in his United Nations speech.[105]

The cooperation continued and India acquired more heavy-water and other nuclear materials from the U.S. under a 1956 agreement. As ~~will be~~ seen in section ~~3~~ 2 ~~below~~ above, CIRUS was acquired as a Colombo Plan facility from Canada.[106] Before that, India had established a research reactor, ASPARA, with technical and financial assistance from Britain in August 1956.[107] All these facilities had been acquired under the framework of international cooperation in the field of atomic energy which made India the largest recipient of atomic energy technology and materials. Therefore, Nehru's apprehensions about the Eisenhower proposal and similar international efforts which led to the formation of the IAEA (International Atomic Energy Agency) may be justified in principle, but did not dissuade India from taking advantage of internationally

---

[104] United States Atomic Energy Commission, Press Release (No. 598), dated 12 February 1955 (Washington DC, National Security Archives, 1989).

[105] ibid.

[106] The Colombo Plan for Cooperative Economic Development in South and Southeast Asia went into effect on 1st July 1951 and was intended to stimulate long term development in the region, FRUS 1955-1957, Vol. VIII. p. 276.

[107] Bhabha Atomic Research Centre, see MILESTONES.

provided nuclear technology.

It appears that Nehru was preparing a case that while India would benefit from the international cooperation in the field of atomic energy by receiving technology and financial assistance, it could still refuse any form of international safeguards through objections about the nature and scope of any agency created to exercise the safeguards. India raised strong objections to the proposed statute of the IAEA and opposed its safeguards system after the agency was established. The entire exercise from the 'Atoms for Peace' proposal to the creation of IAEA, was looked upon with apprehension as an attempt to legitimize international control over the atomic energy programmes of countries like India.[108] It seems that Indian nuclear diplomacy focussed upon the rejection of international safeguards with obvious security motives in sight, so that an option could be kept open if the need arose for India to develop nuclear weapons at a subsequent stage. The Indian objection were not merely because of any intrinsic deficiencies in the proposed forms of IAEA. India possessed strategic raw material like thorium and beryllium, and its political and scientific elite was aware of their potential role for the development of nuclear power. They did not want to accept limitations on how it could be used.

Dr. Bhabha was a staunch opponent of the IAEA safeguards system from its inception because he believed it was discriminatory in nature. During negotiations on the draft statute of the IAEA, Bhabha stated: 'The problem of securing the world against atomic peril is too big and grave a problem to be solved merely by inspection and the type of safeguards

---

[108] Nehru, <u>INDIA'S FOREIGN POLICY: SELECT SPEECHES</u>, pp. 192-192.

contained in this draft statute'.[109] He continued that the safeguards were 'discriminatory' against the new states because they were applicable to their establishments which were entirely peaceful but not applicable to the establishments of the nuclear weapon states which were military-oriented.[110] He lamented that the Agency's primary function ought not to be a police body but a positive and creative force for good.[111] It is well known that he openly defended India's right to carry out nuclear explosions for 'peaceful' purposes but frankly admitted that the technology of a PNE was indistinguishable from a military device. He tended to exploit the weaknesses and loopholes of the non-proliferation regime to secure Indian interests in nuclear explosive technology and avoid the application of safeguards on the Indian nuclear programme. He concealed his opposition to the international safeguards in their 'discriminatory' nature by demanding their reciprocal application on the nuclear establishments of the nuclear weapon states. Indian nuclear diplomacy in the Nehru era became a guidepost for successor governments which mostly adhered to Nehru's fundamental precepts by adjusting to the international environment, but without effecting any major changes.

A countervailing but less significant influence on Nehru in this regard was from his chief foreign policy spokesman, Mr. Krishna Menon. Unlike Nehru, he was unequivocally against India's acquisition of nuclear weapons. He believed that nuclear weapons have "absolutely no military utility either in war or defence" and regarded them only as "weapons

---

[109] Bhabha in, J.P. Jain, _NUCLEAR INDIA PART I_ (New Delhi, Radiant Publishers, 1974), p. 28

[110] _ibid_.

[111] _ibid_. pp. 71-75.

of mass extermination".[112] Michael Brecher considered Menon's views a 'rigid posture', and a 'facile dismissal of all options to safeguard India's security'.[113] Jain noted Menon's influence on Nehru about nuclear weapons: 'It would, indeed, be futile on the part of any one, including Krishna Menon, to assert that Nehru would not have given any thought whatsoever to making the bomb for all times to come'.[114] Nehru's disarmament thinking was no doubt influenced by Krishna Menon, but Bhabha's influence appears more decisive. A close look at the decision-making process indicates that Menon's influence was restricted to disarmament policy. Bhabha, on the other hand, had exclusive access to Nehru on the atomic energy programme. As will be seen in the subsequent section, Bhabha's position was unique in this matter.

4. ADMINISTRATIVE FRAMEWORK OF INDIA'S NUCLEAR PROGRAMME IN THE NEHRU ERA

A brief survey of the administrative set up of India's nuclear programme is essential in order to appreciate the development strategy employed by Nehru and Bhabha to create a nuclear weapons option. In its formative years, India's nuclear programme enjoyed the supervision of Bhabha. He was a person of exceptional scientific competence and leadership calibre. He laid the technological foundation of the programme and is generally acknowledged as the father of

---

[112] Michael Brecher, *INDIA AND WORLD POLITICS: KRISHNA MENON'S VIEW OF THE WORLD* (New York, Praeger, 1968), p. 228 & 329.

[113] *ibid*. pp. 230-232

[114] Jain, *NUCLEAR INDIA, PART I*, pp. 183-84.

India's nuclear industry.[115] He was personally instrumental in persuading the Dorab Tata Trust and the Indian government to manage financial support for the establishment of Tata Institute of Fundamental Research in 1944.[116] According to Dr. Srinivasan, construction of the solid foundation of India's nuclear industry owes a lot to 'Bhabha's seminal personal contribution'.[117] From an administrative point of view, the Indian nuclear programme enjoyed a unique patronage. As noted earlier, the priority which Nehru's government attached to nuclear energy matters is also evident from the fact that it introduced the Atomic Energy Act in the Constituent Assembly within 8 months of independence.[118] After its passage on 15 April 1948, the Indian Atomic Energy Commission (AEC) was set up on 10 August 1948, with Bhabha as its first Chairman, Dr. S.S. Bhatnagar as member-secretary and Dr. K.S. Krishnan as a member.[119] The Indian AEC was assigned the responsibility of protecting Indian national interests in the field of atomic energy, of surveying nuclear minerals and developing them in the form of industrially usable products, fostering fundamental research and development on nuclear technology, training of nuclear scientists and developing expertise in the field of nuclear technology.[120] The Atomic Energy Act of 1948 gave the

---

[115] Dr. M.R. Srinivasan, 'Reminiscences of Homi Bhabha', *Nuclear India*, Vol. 25, No.5-6 (Bombay, Department of Atomic Energy, Government of India, 1987), p. 12. DR. Srinivasan later became the Chairman, Indian AEC and the Secretary, DAE.

[116] *ibid*.

[117] *ibid*.

[118] *Constituent Assembly (Legislative Debates-Official Records)*, Second session, Vol. V (1), 6 April 1948, p. 3315.

[119] *Ten Years of Atomic Energy in India: 1954-1964* (Bombay, DAE, GOI, 1964), p. 4.

[120] *ibid*.

Indian government an exclusive control over atomic energy matters. The government embargoed the export of strategic raw materials for commercial reasons except in exchange for nuclear materials required for the development of its nuclear programme.[121] The Department of Atomic Energy (DAE) was set up on 3 August 1954 under the direct supervision of Nehru as the Minister-in-charge of atomic energy and with Bhabha as its Secretary.

The AEC and DAE are India's premier institutions for the management of its nuclear industry, entrusted with full responsibility for planning and implementation. The Indian AEC has mostly performed the role of policy formulation and setting guidelines for the DAE to implement nuclear planning in the wider national perspective.[122] According to official Indian view, the strategic nature of atomic energy and its political and international significance justified the creation of Indian AEC.[123] The DAE is the chief executive organ of the Indian nuclear programme. Its original function has been and remains, the development of nuclear power and to promote its various uses. In 1962, the Atomic Energy Act was amended to provide more authority to the central government to cope with the expanding atomic energy programme.[124] The membership of the AEC was enlarged from three to five.[125]

The present organization of the atomic energy programme in India is managed primarily under the 1962 Atomic Energy Act. It provides overall control of the nuclear

---

[121] Department of State, Central Decimal File, 891.2546-/. 5-1154, dated 11 May 1954.

[122] Annual Report 1957-1958: Department of Atomic Energy (Bombay, GOI, 1958), pp. 25-30.

[123] ibid.

[124] *Nuclear India* 24 (5 & 6), 1985. pp. 1-2.

[125] ibid.

programme to the DAE. The Indian P.M. being the ex-officio Minister-in-charge of the DAE is advised by the AEC on policy matters. The programme is solely financed by the government of India through the DAE and has been a top priority of the Indian Government despite financial difficulties. The external financial and technological support comes through agreements with the central government in the form of credits and loans.

Bhabha as the AEC Chairman and Secretary of the DAE was only and directly responsible to Nehru. The wide range of his responsibilities illustrated the enormous extent to which he might have exercised a corresponding influence on Nehru and exclusive authority over the atomic energy affairs. The fact that Bhabha simultaneously held four key positions, Chairman AEC, Secretary DAE, Director TIFR and Director of the Atomic Energy Establishment at Trombay (renamed as Bhabha Atomic Research Centre, fully illustrates Nehru's confidence in him. The DAE enjoys so much administrative and financial autonomy that it has been described as a 'state within a state'.[126] Bhabha continued to enjoy that status until his death in an air crash on 24 January 1966 at Mont Blanc.[127] His vigorous personality proved the driving force in the Indian nuclear programme in its formative phase.

Innate secrecy was the hallmark of the decision-making process in the field of atomic energy. There were strict guidelines that no government functionary other than Nehru could discuss the issue of nuclear weapons in public. According to Michael Brecher, 'by Nehru's own admission', the decision about Indian acquisition or non-acquisition of nuclear weapons was never brought before the Indian cabinet

---

[126] Marwah, p. 100.

[127] <u>Nuclear India</u>, 23 (2), 1984, p. 7.

from 1947 to 1963.[128] A similar approach is reflected in Krishna Menon's statement about India's acquisition of nuclear weapons. He expressed the view that the debate on the issue of nuclear weapons was prejudicial to the Indian interests.[129] It is not clear how the debate would have proved prejudicial to the Indian interests if India were not to acquire nuclear weapons. It reflects a concern that the debate might divulge information about the inherently secret process of decision-making. The set up of the Indian nuclear programme was planned in a way that Prime Minister retained direct and full control. Except Nehru and Bhabha, nobody knew exactly the full depth of the Indian nuclear programme.

5. DOMESTIC FACTOR IN THE NEHRU ERA

Domestic debate on nuclear weapons predates the emergence of the Chinese nuclear threat to India, a threat which remained conventional until 1962, but assumed nuclear dimension after October 1964 test by China. The debate gradually developed momentum in the immediate aftermath of the Sino-Indian conflict in 1962 and became intense after China's first nuclear explosion. It developed along two parallel processes: intra-governmental and extra-governmental, without, at least initially, a recognizable interaction between the two. At the intra-governmental level, the issue of nuclear weapons' development seized the attention of the Indian officialdom immediately after independence. At the extra-governmental level, the debate was largely originated

[128] Michael Brecher, *NEHRU'S MANTLE: THE POLITICS OF SUCCESSION IN INDIA* (New York, Praeger, 1968), pp. 126-27. Brecher's information is based upon his interview with Nehru which took place in 1963.

[129] Brecher, *INDIA AND WORLD POLITICS: KRISHNA MENON'S VIEW OF THE WORLD*, p. 228.

after China's first nuclear test. At the intra-governmental level, Nehru personally initiated the debate on the uses of nuclear energy at the time when the Atomic Energy Bill was introduced in the Constituent / Legislative Assembly in April 1948. He stated:

> If we do not set about now, taking advantages of the processes that go towards the making of atomic energy, we will be left behind. That is not good enough for any country, least of all for a country with vast potential and strength like India'.[130]

In May 1954, Dr. Meghnad Saha, a well known nuclear physicist and member of Parliament, urged the government during a parliamentary debate on atomic energy to intensify nuclear research and development by immediately increasing its appropriations from the 'present Rs. 30,000,000 (about $ 6,300,000) to at least Rs. 100,000,000 ($ 21,000,-000)'.[131] He stressed that atomic research was of particular interest to India because its power potential was very limited.[132] Nehru responded in a lengthy speech, and reiterated:

> The use of atomic energy for peaceful purposes is far more important for a country like India, that is to say, in a country whose power resources are limited, than a country like France, an industrially advanced country..... It is important for a power-starved or a power-hungry country like India or like most of the other countries in Asia and Africa.[133]

Since the debate was being conducted in the context

---

[130] Constituent Assembly (Legislative Debates-Official Reports), second session, Vol. V (1), 6 April 1948, p. 3315.

[131] Department of State, Central Decimal File, 891.2546/. 5-1154, dated 11 May 1954.

[132] ibid, pp. 1-2.

[133] Text of The Prime Minister's Speech on the Uses of Atomic Energy, dated 10 May 1954, pp. 6-7.

of the use of atomic energy for peaceful uses only, there was no reference to its military use or an indication of the possibility of other than energy generating purposes. However, Nehru did touch upon the broader issues in general terms as under:

> By August 1945, Hiroshima fell, -- the result of the work from 1939 to 1945. Since then, of course, tremendous progress has been made in this and the world has been struck by it because it is a terrible thing. Now, therefore, the human mind and human efforts are unleashing tremendous powers without quite knowing how to control them. You will not control these by mere demands to ban this or to ban that. Nobody can really control the human mind from going on unleashing new things; they will go on doing that way.[134]

The point being made here does not concern Nehru's motives regarding the use of atomic energy for peaceful or military purpose. It is meant to say that he proved his leadership qualities by dominating the debate. In addition to Nehru, many prominent politicians, civil servants and technocrats like Dr. Bhabha, Arthur Lal, Raj Krishna, V.C. Trivedi, Krishna Menon and others were responsible for various inputs in each phase of the evolution of the Indian nuclear policy. However, not much was stated in public about the intra-governmental process before the 1962 Sino-Indian conflict. It was in the wake of the first intensive nuclear debate (1964-1968) that the key figures involved in the decision-making process expressed their views in public.

A review of the parliamentary debates during the Nehru era indicates the absence of a serious discussion on the substantive nuclear issues such as the acquisition of nuclear weapons. Parliamentary discussions and inquiries dealt essentially with matters such as international nuclear disarmament and the superpower arms race etc. In fact, the

---

[134] ibid. pp. 5-6.

Parliament was used as a forum by the government to announce its nuclear decisions and to give progress reports regarding the civil uses of nuclear technology. An exception was Bhabha's statement before the Parliament's Consultative Committee on Atomic Energy in 1959.[135] There is no further evidence of any substantive issues raised. A discussion on such issues in the public institutions might had been precluded by Nehru's rule of secrecy about nuclear matters.

It seems that India's nuclear strategy in the Nehru era focussed on the development of a nuclear weapons option within the framework of its civilian nuclear energy power programme, but without making it too visible and without formal acknowledgement. It was designed to remain secret until complete self-sufficiency was achieved and political circumstances demanded making it visible. Technologically, it continued to promote a nuclear weapons option based upon the nuclear dual-use infrastructure. Politically, India maintained a policy of not making nuclear weapons, but stressed its right to do so if there was no progress in nuclear disarmament. Morally, India claimed a high ground because of its policy of not making nuclear weapons, and campaigned for nuclear disarmament. On the diplomatic front, India continued to refuse the acceptance of international safeguards and denied verification of its claim about the "exclusively peaceful uses" of its nuclear power programme. From a domestic point of view, its refusal to accept the safeguards on the development of a dual purpose nuclear capability enhanced the credibility of Indian government that a weapons option was not abandoned. It improved its prestige of strengthening national sovereignty and its international image. This strategy allowed India to escape the penalties of an open and declared nuclear weapons programme. As a result, it continued to receive

---

[135] See note 35, p. 66.

economic, technological and financial assistance from Western sources, particularly Canada and the U.S. It also allowed India to allay the apprehensions of the superpowers, given their commitment to nuclear non-proliferation, about the Indian role in the proliferation of nuclear weapons.

However, in the light of the above evidence, the validity of the findings that the genesis of India's nuclear option lies in the post-Nehru era (around the first Chinese nuclear test) becomes questionable. In fact, the foundation of Indian nuclear weapons option was designed in the 1950s under Nehru, and was almost complete by the time of his death. Nehru generated calculated ambiguity about India's commitment to use nuclear energy for peaceful purposes but the technological thrust of India's nuclear programme indicated a priority for a weapons oriented direction over civilian uses. It appears that, given his preoccupation for a **'Greater India'**, Nehru had decided in favour of developing a nuclear weapons option for a deterrent *in extremis* (distant future) from a long term power perspective and strategic reassurance of India. A nuclear power potential based upon the latest scientific and industrial development also appeared as a symbol of national status and pride to the Indian leadership under Nehru. However, nuclear capability as a demonstration of great power status appeared a more appropriate rationale.

Chapter Four

INDIAN NUCLEAR STRATEGY 1964 - TO- 1977
FROM NUCLEAR OPTION TO A WEAPONS CAPABILITY

This chapter examines the development of India's nuclear option into a weapons capability under the governments of Prime Ministers Lal Bahadur Shastri and Mrs. Indira Gandhi. It analyses the impact of various determinants on Indian nuclear policy during the period from 1964 to 1977, which provided the stimulus for progress towards a weapons capability. The most notable was the first nuclear test by China on 16 October 1964. The chapter also evaluates the diplomatic and domestic inputs in India's nuclear policy, like the issue of nuclear security guarantees, Treaty on the Non-Proliferation of Nuclear Weapons (NPT) of 1968 and the nuclear debate in India. It further assesses the effects of these developments on the decision-making process and the momentum of development of a nuclear weapons capability. As noted in the previous chapter, this study questions validity of the traditional view that India's nuclear option was developed in the post-Nehru era in response to the first Chinese nuclear test.[1] On the contrary, it suggested that the option had in fact materialized by the time China carried out its test. The Chinese test proved a catalyst for the conversion of nuclear option into a weapons capability. However, other developments had their influence as well. These developments determined the momentum of change but not the change itself. Indian nuclear weapons capability gradually developed with the expansion of the civilian nuclear programme within which it was incorporated. The 1974 Indian nuclear test appears a logical, albeit delayed, outcome of the nuclear policy formulated in

[1] See previous chapter (Three), pp. 57. Pran Chopra holds the same view, interview with Pran Chopra on 23 November 1988 at Wilton Park, England.

the Nehru era which was followed by his successors according to the circumstances of their time and political suitability.

1. IMPACT OF CHINA AND THE INDIAN NUCLEAR POLICY IN THE SHASTRI PERIOD: MAY 1964 TO JANUARY 1966

Mr. Shastri succeeded Nehru as Prime Minister at a time (May 1964) when India had not yet fully recovered from the trauma of defeat in the 1962 conflict with China. On 16th October 1964, China carried out its first nuclear test which added further complexities to the Indian security dilemma. That development exacerbated the Indian perceptions of a threat from China which was conventional in nature before, but acquired a nuclear dimension after the test. It proved the *raison d'etre* for an intense debate in India over its acquisition of nuclear weapons in response to threat from China. Shastri's government came under considerable pressure to develop nuclear weapons. Since Shastri did not operate from a position of strength comparable with Nehru, he appeared to appease critics in the debate within the Parliament and outside. In a policy statement in the Lok Sabha on 27 November 1964, he stated, 'I cannot say that the present policy [of nuclear pacifism] is deep-rooted, that it cannot be set aside and that it would not be changed'.[2] Shastri's statement had two obvious policy implications. First, he implicitly acknowledged that the policy of 'only peaceful use' of nuclear energy was not 'deep-rooted', and second, he underlined the new orientation of his own policy. He favoured development of nuclear explosives for "peaceful purposes" and indicated the possibility of India carrying out a PNE (peaceful nuclear explosion) in the near future.[3] In fact, Shastri sanctioned

---

[2] Lok Sabha Debates, Vol. 35, 3rd series, 27 November 1964, Col. 2287.

[3] ibid.

the Subterranean Nuclear Explosion (SNE) Project on Bhabha's recommendation almost the same time he made the statement.[4]

This was the first public manifestation of a decisive step forward in India's nuclear weapons development. In K. Subrahmanyam's view, the Subterranean Nuclear Explosion Project was a peaceful nuclear explosion but would give India the same technology as a weapon test.[5] According to Dhirendra Sharma, Shastri's decision provided Bhabha the latitude to conduct R & D on a bomb design and its non-nuclear components.[6] Immediately after the Chinese test, Bhabha announced at a press conference that India could produce a nuclear bomb within 18 months.[7] Later, he went on to add that India could develop an arsenal of 50 nuclear weapons and 50 two-megaton hydrogen bombs.[8] It was a tall claim in view of India's state of technological (nuclear) development at that time. However, Shastri's government demonstrated an urgency to deal with the crisis created by China's nuclear tests. A U.S. report assessed the prevailing situation as follows: 'the political feeling in India at the present time is influenced by the warlike nature of the act required and problem posed by atmospheric or even underground testing'.[9] An official U.S.

---

[4] Wohlstetter, p. 109.

[5] The decision about the SNE project was confirmed by K. Subrahmanyam during an Interview on 22 November 1988 at Wilton Park, England. Subrahmanyam has formerly served in the Indian Ministry of Defence from where he was deputed as Director of the Institute of Defence Studies and Analyses [IDSA], New Delhi.

[6] Dhirendra Sharma, pp. 88-91.

[7] HINDUSTAN TIMES, 19 October 1964.

[8] Bhatia, p. 114.

[9] W.W. Rostow, A Way of Thinking About Nuclear Proliferation; NATIONAL SECURITY FILE, Committee File - Committee on Nuclear Proliferation, India (Box 1), November 1964, Lyndon B. Johnson Library, Texas.

source further stated, 'following the CHICOM [Communist China-'s] nuclear detonation, the Indian military services were directed to prepare a study and recommendations [top secret] on its military implications for India'.[10] The study was reportedly completed and submitted to the Indian government but no further information is available about its nature and contents.[11]

Notwithstanding Bhabha's claim to produce a bomb within 18 months, an immediate resumption of a full-scale nuclear weapons programme after the Chinese test was not possible because India's capacity to produce weapons-grade plutonium was very limited. As noted in the previous chapter, the only source of fissile-plutonium was CIRUS, commissioned in 1960 with a capacity to produce 9.4 kg plutonium per year and the reprocessing plant that had just been completed.[12] There was no immediate possibility of producing nuclear weapons. A nuclear test was thought to be feasible within 18 months, but it would have only provoked China's acceleration of its nuclear weapons programme without helping India in any way. However, the Indian nuclear capability had reached a level of development from where the pursuit of a nuclear weapons programme could be realized on a long-term basis. Therefore, Shastri's emphasis on change cannot be dismissed as an attempt to placate the intensity of domestic political pressure to go nuclear as some accounts of his policy sug-

---

[10] INCOMING MESSAGE: DEPARTMENT OF THE AIR FORCE, STAFF MESSAGE BRANCH, AF IN: 11932 (7 DEC 64) C/ptl to DIA (Defence Intelligence Agency) declassified NLJ 90-214 dated 11-29-90, Lyndon B. Johnson Library, Texas.

[11] ibid.

[12] See previous chapter, section, 2, pp. 74-81.

gest.[13] His policy statements about change were backed by the decision to undertake the SNE Project. The existing accounts of Shastri's nuclear policy are imprecise either because of a lack of proper information about his decision on the SNE Project or through ignoring his period as a brief interlude.[14] He only rejected the pressure to commit India to develop a nuclear deterrent against China as a short-term measure which he thought would be economically prohibitive and strategically inadequate. Inaugurating the plutonium reprocessing plant at Trombay on 22 January 1965, Shastri declared: 'We cannot afford to spend millions and millions over nuclear arms when there is poverty and unemployment all around us'.[15] However, his declaration looks perfunctory in view of his decision in favour of the SNE Project.

Once the initial trauma was over, P.M. Shastri's government evaluated the Chinese nuclear ~~test~~ threat as a potential, but not immediate and so relegated it in severity.[16] It also considered that an Indian nuclear weapons capability would be inadequate at that time for a credible deterrent against China.[17] It could not produce sufficient number of nuclear weapons because India did not possess enough quantities of plutonium and it had not yet laid the basis for an adequate

---

[13] Ernest W. Lefever, *NUCLEAR ARMS IN THE THIRD WORLD: U.S. POLICY DILEMMA* (Washington, Brooking Institution, 1979), p. 28-30; and Shelton L. William, *THE U.S., INDIA AND THE BOMB* (Baltimore, The John Hopkins press, 1969), pp. 38-40.

[14] ibid.

[15] Lal Bahadur Shastri, *SPEECHES OF PRIME MINISTER LAL BAHADUR SHASTRI: JUNE 1964-MAY 1965* (New Delhi, Government of India GOI, 1965), p. 17.

[16] Keesing's Contemporary Archives, Vol. 15, 6-13 February 1965, p. 20567.

[17] Maj. Gen. D. Som Dutt, *INDIA AND THE BOMB*, Adelphi Paper No. 30 (London, International Institute for Strategic Studies, November 1966), pp. 5-6.

delivery system.[18] There is no reliable evidence that it had adequate experience of technology to fabricate nuclear weapons at that time. Bhabha's statement that India could produce a number of atomic and hydrogen bombs was based upon a long-term perspective and he might have wanted India to embark upon the process. Shastri and Bhabha both died in January 1966. It was a serious blow to the SNE Project. The momentum for the development a nuclear weapons capability was severely disrupted.

2. INDIA, CHINA AND THE NUCLEAR SECURITY GUARANTEES

Shastri's interim strategy to ward off the Chinese nuclear threat to India and its implications for the public at large was to highlight India's interest in a unilateral or multilateral nuclear security guarantee. Shastri met the British Prime Minister Harold Wilson on 4 December 1964 and in a press conference after the meeting urged the nuclear weapon states to consider the ways in which they could guarantee the security of non-nuclear nations.[19] He said: "I think it would be important for the nuclear powers to consider how they can guarantee the safety and security of non-nuclear countries. It would be vital on their part to give serious thought to the problem".[20] On a question, whether he thought it desirable and useful for India to obtain guarantees against a nuclear attack, the Premier replied that it

---

[18] CIRUS reactor was commissioned on 10 July 1960 and has a capacity to produce 9.4 kg plutonium per year. That means India had approximately 37.6 kg of plutonium by 1964. Given the Indian R & D requirements, it was not enough for the development of a small nuclear deterrent.

[19] INDIA, NATIONAL SECURITY FILE, Committee File - Committee on Nuclear Proliferation, India (Center Folder - Box 6), Lyndon B. Johnson Library. Texas, p. 19.

[20] ibid.

was not only for India that such guarantees were needed but for all non-nuclear countries.[21] On a further question that how a non-aligned, non-nuclear India could defend itself against an attack by a nuclear country, Shastri replied, 'each country needs to devise its own ways and means of defence'.[22] He continued, "we should not think on selfish lines. I hope that, if all the non-nuclear countries combine, they can create the necessary climate in the world for the non-use of nuclear weapons".[23]

Britain appeared sympathetic to the Indian concerns but provided only informal assurances. The Indian Minister of External Affairs, Mr. Swaran Singh, later clarified that the obligation of nuclear powers was considered "moral and not a specific guarantee for India".[24] The U.S. response to the Chinese nuclear test and threat it posed to the security of the non-nuclear weapon states (NNWS) was declared by President Lyndon B. Johnson. He stated: "The nations that do not seek national nuclear weapons, can be sure, if they need our strong support against some threat or nuclear blackmail, then they will have it".[25] However, U.S. officials believed that the 'generalized assurances of security against nuclear blackmail' provided in President Johnson's statement seemed to have no real effect on the Indian leaders about the adequacy of the security guarantee.[26] The U.S. seemed unwilling to go beyond

---

[21] ibid, p. 20.

[22] ibid.

[23] ibid.

[24] TIMES OF INDIA, 9 December 1964.

[25] U.S. Department of State Bulletin, 2 November 1964.

[26] R. Murray, PROBLEM OF NUCLEAR PROLIFERATION OUTSIDE EUROPE (PROBLEM 2); December 1964, NATIONAL SECURITY FILE, Committee File - Committee on Nuclear Proliferation, India, Lyndon B. Johnson Library, Texas, p. 14.

that position and provide a specific nuclear security guarantee to India. An indication of that is reflected from a U.S. government paper on the subject:

> We believe we have already reinforced Indian leaders in their present policy by providing the general assurances which were included in the President's statement of October 16 and his speech of October 18. For the present, we believe these assurances are adequate for our purposes.[27]

Three nuclear weapon states (NWS), the U.S., the U.S.S.R. and the U.K. shared India's perception of a nuclear threat from China to varying degrees. The possibility of a joint guarantee from all the three appeared remote on the eve of detente when the cold-war paradigm was still intact. India seemed well aware of the superpowers' unwillingness to provide iron-clad formal guarantees against China. According to Shastri's admission in the Lok Sabha, his government did not receive an encouraging response on the issue of nuclear security guarantees.[28] As a matter of fact, Indian search for a nuclear security guarantee was paradoxical. It was incompatible with its continued penchant for non-alignment and irrevocable renunciation of a nuclear military option. Shastri's statement in London bear out quite clearly that he was evasive on the issue of a nuclear security guarantee for India. There was disagreement as well as confusion within Shastri's government itself about a security guarantee as a final policy choice in view of its perception of the long-

---

[27] BACKGROUND PAPER ON FACTORS WHICH COULD INFLUENCE NATIONAL DECISIONS CONCERNING ACQUISITION OF NUCLEAR WEAPONS (Sanitized); NATIONAL SECURITY FILE, Committee File - Committee on Nuclear Proliferation, India, Lyndon B. Johnson Library, Texas, pp. 7-8.

[28] Lok Sabha Debates, 1965, Vol. LXVIII, p. 4295.

term nuclear threat from China.[29] The Indian Foreign Minister stated, 'there is an increasing awareness that nuclear protection to non-nuclear weapon states is difficult to implement'.[30] He further said, 'the only effective guarantee against a nuclear threat would lie in the elimination of nuclear weapons and their delivery systems'.[31]

However, India took an active part in demanding undertakings through the United Nations to safeguard the security of the NNWS which might be threatened by nuclear weapons states.[32] Such an undertaking was also demanded against the states which were likely to develop a nuclear weapons capability.[33] The Indian concern about China' growing nuclear weapons capability seemed to govern its policy on nuclear security guarantees. It supported a multilateral security guarantee as a NNWS which perceived a nuclear threat from China.[34]

The initiative for a nuclear security guarantee within the U.N. framework came from the NNWS as an alternative security option if they were to forego nuclear weapons. Under consistent demands from the NNWS, the three NWS, the U.S., the U.S.S.R. and the U.K. reached an agreement to introduce a tripartite draft resolution in the U.N. Security

---

[29] A. G. Noorani, 'India's Quest for a Nuclear Security Guarantee', *Asian Survey*, 3 (7), July 1967, pp. 490-502.

[30] ibid.

[31] ibid.

[32] Disarmament Commission, Official Records, 75th Meeting, 1966-67, p. 4.

[33] Ibid.

[34] Documents of Disarmament: 1967 (Washington, U.S. Arms Control and Disarmament Agency, 1968). p. 204.

Council containing nuclear security guarantees.[35] The guarantees were in the form of unilateral but identical declarations by the above three NWS and offered as an adjunct to the NPT. General Assembly endorsed the NPT vide Resolution 2373 (XXII) on 12 June 1968.[36] On 17 June 1968, the U.S., the U.S.S.R. and the U.K. submitted the draft resolution to the U.N. Security Council which was approved on 19 June 1968 as 'Resolution 255', by ten votes with none against but five abstentions: Algeria, Brazil, France, India and Pakistan.[37] Resolution 255 states that the U.N. Security Council:

> Recognizes that aggression with nuclear weapons or the threat of such aggression against a Non-Nuclear Weapon State will create a situation in which the Security Council, and above all, its Nuclear Weapon State permanent members, will have to act immediately in accordance with their obligations under the United Nations Charter,

and the Security Council;

> Welcomes the intention expressed by certain states (the USA, the USSR and the UK) that they will provide or support immediate assistance, in accordance with the Charter, to any Non-Nuclear Weapon State Party to the Treaty on Non-Proliferation of Nuclear Weapons, that is a victim of an act or an object of a threat of aggression in which nuclear weapons are used.[38]

India not only questioned the conceptual premises and procedural adequacies of the Resolution 255, but also rejected the security guarantees contained in that resolution. The Indian Ambassador, G. Parathasarthi spoke at length

---

[35] Joseph Goldblat, 'The U.N. Security Council Resolution of 19th June 1968 and Security of Non-Nuclear Weapon States', _NUCLEAR PROLIFERATION PROBLEMS_ (Stockholm, Almqvist & Wiksell for SIPRI, 1974), p. 236.

[36] _ibid_.

[37] _ibid_. p. 237.

[38] _ibid_. pp. 240-41.

against the Resolution. He said,

> I should like to emphasize that any security assurances that might be offered by the nuclear weapon states could not and should not be regarded as a *quid pro quo* for the signature of a non-proliferation treaty. A non-proliferation treaty should be judged by itself and on its own merit.[39]

He continued that the nuclear threat to the NNWS arose directly from the possession of nuclear weapons and would remain until the nuclear menace had been eliminated altogether.[40] In this later objection, Ambassador Parathasarthi raised a fundamental question which indicated that India was not interested in rectifying the procedural inadequacies in Resolution 255 in order to make it acceptable, but questioned the very basis of the assurances. His successor, Ambassador V.C. Trevedi's statement further clarifies Indian rejection of the validity of security guarantees. He said,

> So far as the non-aligned nations are concerned, security is not synonymous with protection, no matter how powerful the protector or how sincere. Real security lies in the elimination of the threat than in offering protection after the threat has been translated into actual aggression.[41]

The foregoing suggest that India's diplomacy aimed at seeking a nuclear security guarantee gradually drifted away and it rejected that option as an inadequate framework to provide protection to the NNWS.

However, the lack of credibility or precision of the nuclear security guarantees cannot be assigned to the superpowers alone. The application, credibility and precision of the superpowers's guarantees have to be examined in relation to the specific country. President Johnson's as-

---

[39] U.N. Document S/PV. 1433, 1967-68.

[40] ibid.

[41] Disarmament Conference Document ENDC/PV. 240.

surance to those who felt threatened by China's nuclear test in 1964 is quite explicit on the issue. The prospective recipient had to forego the development of national nuclear weapons in order to benefit from the security guarantee offered. India was not a legitimate candidate because it was not willing to forego its nuclear weapons option. It is equally important to appreciate that Shastri's government was unwilling to accept that the Indian security would be a function of the superpowers' politics, given that self-reliance and non-alignment were the highest Indian priorities.

Subsequently, the Indian policy on this subject underwent a significant change. The change was precipitated not only by the divergent approaches of the NWS and the NNWS on the fundamental and contentious issues about the credibility of security guarantees but also because of India gradually shifting from its nuclear option to the development of a weapons capability. India reaffirmed in public its policy of not making nuclear weapons but actually worked to develop nuclear explosives technology. The Indian position reflected a dual orientation on the issue of nuclear security assurances, and Indian decision-makers demonstrated a unique ambivalence in this regard. In the period immediately after the 1964 Chinese nuclear test, India seemed to be interested in the nuclear security assurances. Its interest gradually diminished as the trauma of that nuclear test receded and the expansion of its own nuclear weapons capability continued. However, India's mistrust in the validity of nuclear security guarantees from the great-powers contributed to its adherence to the long-term objective of developing a nuclear weapons capability.

Mrs. Indira Gandhi did not hide her mistrust of nuclear security guarantees. 'In the final analysis, the effectiveness of a nuclear shield will depend not on the spirit in which protected powers accepted it, but on the vital national interests of the givers', she said.[42] India's Minister for External Affairs lamented the lack of credibility of nuclear security guarantees by saying that India might be destroyed before the Security Council could even convene a meeting.[43] He questioned the credibility of a prompt, reliable and adequate action, as there were likely to be serious differences on the very definition of nuclear threat or what constituted nuclear blackmail.[44] In fact, India had already embarked on the course towards developing a nuclear weapons deterrent in line with maintaining an independent foreign policy. It was therefore, not interested in a security guarantee. Summarizing the Indian arguments for a nuclear weapons policy, Peter Lyon stated as follows:

> The independent ability to escalate a conflict confers flexible deterrent capability, the only way for India to have a credible deterrent and to escape the discomforts and uncertainties of an alliance policy and/ or of nuclear guarantees offered by another Power or Powers is to develop her own independent capability; to possess nuclear weapons oneself is the only way to possess the ultimate deterrent, if such there be.[45]

At the end, India decided not to accept security guarantees due to its long-term objective of developing a nuclear weapons capability. Although there were genuine flaws in the guarantees offered, that was not the exclusive reason for which Indian Ambassadors at the ENDC and various disarmament forums questioned the credibility of a nuclear security guarantee.

---

[42] Asian Recorder, 30 July - 5 August 1967, p. 7833.

[43] A.G. Noorani, op. cit. p. 497.

[44] ibid.

[45] Peter Lyon, 'The Foreign Policy of India', in F.S. Northedge (ed.), *THE FOREIGN POLICIES OF THE POWERs* (London, Faber and Faber, 1968), p. 283.

3. INDIA AND THE NPT (TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS OF 1968)

Before analyzing Indian diplomacy with respect to the NPT, it is appropriate to say that the Indian NPT policy has already been well documented. In order to avoid undue repetition, it will be very briefly reviewed to bring into focus the overall Indian nuclear diplomacy. India's initial attitude on evolution of the NPT was supportive, but it gradually hardened into rejection. Mrs. Gandhi was the Prime Minister when both superpowers were pushing towards an early conclusion of the NPT through a concerted diplomacy in the ENDC. The Indian policy on the NPT gradually evolved into the opposite direction to what the superpowers intended.

The concept of the NPT originated from an Irish proposal introduced in the U.N. General Assembly in 1958 through a resolution on the non-proliferation of nuclear weapons.[46] In 1961, the General Assembly established the ENDC which played a crucial role in the conclusion of the NPT.[47] In November 1965, the General Assembly called upon the ENDC for an early conclusion of the treaty on "Non-Proliferation of Nuclear Weapons" with an acceptable balance of mutual obligations between the NWS and the NNWS as a step towards general and complete disarmament.[48] In August 1965, the U.S. presented

---

[46] U.N. Document A/C. 1/L. 206 (Official Records of the U.N. General Assembly, Thirteenth Session, Agenda items no. 64, 70 and 72).

[47] The U.N. General Assembly Resolution No. 1722 (XVI), General Assembly Official Records, Sixteenth Session, Supplement No. 17 (A/ 1500), p. 7.

[48] The U.N. General Assembly Resolution No. 2028 (XX), General Assembly Official Records, Twentieth Session, Supplement No. 14 (A/6014), pp. 6-7.

a draft treaty in the ENDC;[49] and in November 1965, the Soviet Union presented a similar draft in the General Assembly.[50] Neither the U.S. nor the Soviet draft was compatible with the principle of balance of mutual obligations set forth in General Assembly Resolution 2028. Both the drafts focussed upon arms control measures to stop the further dissemination of nuclear weapons by the NNWS.

Indian Ambassador at the ENDC, V.C. Trevedi, who was the architect of India's NPT policy, expressed the view that the proposed treaty drafts aimed at imposing all obligations on the NNWS not to seek nuclear weapons while leaving the NWS free to increase and improve their nuclear arsenals.[51] He deplored the approach of the NWS aimed at retaining their nuclear monopoly and preventing additions to the nuclear club.[52] He advocated a global approach to genuine nuclear disarmament without discrimination and based upon the principles of sovereign equality and mutual benefit.[53] However, after six years of intensive negotiations within the ENDC, prolonged debates in the General Assembly and continuous revisions, the U.S. and the U.S.S.R. submitted a final Joint Draft Treaty on 31 May 1968 to the General Assembly.[54] The Assembly endorsed it as the Treaty on Non-Proliferation of Nuclear Weapons in Resolution 2373 (XXII) by 95 votes, with 4

---

[49] Disarmament Conference Document ENDC/162.

[50] U.N. Document A/5976.

[51] Disarmament Conference Document ENDC/240, pp. 10-20.

[52] ibid, pp. 12-15.

[53] ibid, p. 20.

[54] The U.N. General Assembly Resolution 2373 (XXII), General Assembly Official Records, Twenty Second Session, Supplement No. 16 (A/6716/add.1).

against and 21 abstentions.[55]

India and other non-aligned NNWS continued to oppose the NPT on the plea that it lacked a balance of obligations to be undertaken by the NWS in Article I and the NNWS in Article II. They demanded to rectify the imbalance. Article I of the NPT states:

> Each Nuclear Weapon State Party to the Treaty undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices, or control over such weapons or explosive devices directly or indirectly; and not in any way assist, encourage, or induce any Non-Nuclear Weapon State to manufacture or otherwise acquire nuclear weapons or other nuclear explosive devices, or control over such devices.[56]

Article II of the NPT states:

> Each Non-Nuclear Weapon State Party to the Treaty undertakes not to receive the transfer or whatsoever of nuclear weapons or other nuclear explosive devices or control over such weapons or explosive devices directly or indirectly; not to manufacture or acquire nuclear weapons or other nuclear explosive devices, and not to seek or receive any assistance in the manufacture of nuclear weapons or other nuclear explosive devices.[57]

India's primary objection to the NPT was reiterated by Ambassador Trevedi. He said that it imposed far more stringent limitations on the NNWS in Article II than those imposed on the NWS in Article I and therefore, lacked a balance of responsibilities.[58] He also stated that the NPT

---

[55] ibid.

[56] Text of the NPT, U.N., *TREATY ON NON-PROLIFERATION OF NUCLEAR WEAPONS* (New York, United Nations, 1969), Article I.

[57] Ibid. (Article II).

[58] V.C. Trevedi, 'Vertical Versus Horizontal Proliferation', in James E. Dougherty and J.F. Lehman Jr. (eds.), *ARMS CONTROL IN THE LATE SIXTIES* (Princeton, D. Van Nostrand, 1967), pp. 195-96.

addressed the 'hypothetical question of future proliferation' while legitimized the 'actual proliferation' by the NWS.[59] He further elaborated that the real issue was not horizontal proliferation by the NNWS, but vertical proliferation by the NWS:

> India believed and continues to believe that the real problem is in fact of the existing or vertical or intra-spatial proliferation. Further or horizontal or extra-spatial proliferation is only the consequence and not the cause of the present armament tension in the world. Once the cause is removed, the consequence is automatically eliminated.[60]

India also expressed dissatisfaction with the undertakings of the NWS in Article VI: 'to pursue in good faith steps towards disarmament' because they lacked any enforceable or juridical obligations and did not correspond to the obligations undertaken by the NNWS in Article II.[61] Indian policy on the NPT heavily relied upon the General Assembly Resolution 2028 (XX) which emphasized that the treaty should contain a balance of obligations between the NWS and the NNWS. At a specially organized conference of the NNWS in Geneva in August 1968, they expressed their dissatisfaction over lack of balance of obligations in the NPT with regard to vertical and horizontal proliferation of nuclear weapons.[62] The NNWS also demanded that immediate steps be undertaken to foster the development of peaceful nuclear technology in the developing countries and urged the NWS to assume the main responsibilities for financing the projects initiated by the

---

[59] ibid.

[60] ibid.

[61] ibid, p. 197.

[62] IAEA, *A SHORT HISTORY OF NON-PROLIFERATION* (Vienna, IAEA, 1976), pp. 25.

IAEA.[63]

Another Indian objection to the NPT originated from its policy on the question of international safeguards. Article III of the NPT provides a system of inspections, safeguards and verifications of the undertakings in Articles I and II.[64] Article III states that each NNWS, party to the Treaty, undertakes to accept safeguards, for the exclusive purpose of verification of the fulfillment of its obligations under the Treaty with a view to prevent diversion of nuclear energy from peaceful uses to nuclear weapons and other nuclear explosive devices.[65] It also states that NNWS party to the Treaty should conclude agreements with the IAEA to meet the requirements of this article.[66] From India's point of view which from the beginning was opposed to full-scope safeguards, provisions of Article III imposed undue restrictions on the "peaceful" nuclear programmes of the NNWS. It left free the nuclear weapons programmes of the NWS and therefore, unfair from India's point of view. Ambassador Trevedi's poignant statement on the institution of safeguards in the Article III reflects the Indian attitude on this issue:

> Institution of controls on peaceful reactors and power stations is like an attempt to maintain law and order in a society by placing all its law-abiding citizens in custody while leaving free its law-breaking elements to roam the streets.[67]

The IAEA safeguards system endorsed in Article III

---

[63] ibid.

[64] U.N., *TREATY ON NON-PROLIFERATION OF NUCLEAR WEAPONS*, Article III.

[65] ibid.

[66] ibid.

[67] V.C. Trevedi cited in J.P. Jain, *NUCLEAR INDIA PART I*, p. 71.

of the NPT is too extensive to be accepted by a country like India which wanted not only to keep open a nuclear weapons option, but intended to expand it into a weapons capability. It could have also undermined the fundamental objectives of independence and self-reliance on which Indian nuclear capability was based. Otherwise, there is nothing in Article III of the NPT which prohibits India or any other country from developing a nuclear programme for entirely peaceful purposes. On the other hand, Article IV affirms the rights of the NNWS party to the Treaty to undertake research and development in peaceful nuclear technology and to receive assistance from the NWS in this regard.[68]

India also appeared sensitive to any potential limitations on its right to carry out peaceful nuclear explosions (PNEs). Article V of the NPT states that the NWS should make available the potential benefits of peaceful applications of PNEs to the NNWS. Implicitly, it restricted the NNWS to carry out PNEs at their own. It also qualifies that a peaceful nuclear explosion cannot be differentiated from one for military purposes.[69] India argued that the development of PNEs was within the field of peaceful activities.[70] Ambassador M. Hussain enunciated the Indian objection to the NPT provision on the PNEs that it would perpetuate the existing technological gap between the developed and under-developed states.[71] It would thereby, enhance the later's dependence on the former. Since India had initiated a project for the development of PNE technology, it did not want it to be scuttled through the NPT. The NWS adopted quite a different

---

[68] U.N., *TREATY ON NON-PROLIFERATION OF NUCLEAR WEAPONS*, Article IV.

[69] ibid, Article V.

[70] U.N. Document A/C.1/PV.1560.

[71] U.N. Document A/C.1/PV.1567.

position on this question. In a response to the Indian position on PNEs, the U.S. Secretary of State, Mr. Dean Rusk stated,

> From the point of view of the United States, should a state decide that it does not wish to accept a treaty which prohibits the spread of nuclear explosive devices, we will have to conclude that it does not wish to accept a treaty which prevents the spread of nuclear weapons.[72]

Mrs. Gandhi's government rejected the NPT because it was "in-equitous", "discriminatory", and in the words of Mr. Trevedi: "an instrument for non-armament of the un-armed".[73] India was apparently willing to accept the NPT if it were concluded within the framework of the U.N. General Assembly resolutions. In fact, Indian objections to the NPT reflected its concern about the imperative of its national security which it perceived under threat from China. The Indian refusal to sign the treaty demonstrated exigencies of its security interests. By rejecting the NPT, India also established its right to develop nuclear weapons as and when required. Mrs. Gandhi explicitly stated: "We for our part may find ourself having to make a nuclear decision any moment, and therefore, it is not possible for us to tie our hands".[74]

China loomed large in India's NPT policy. As Ambassador Hussain stated at the ENDC, it was a matter of great concern to India that China had not signed the Partial Test Ban Treaty and continued to conduct nuclear tests in the atmosphere.[75] India's perception of a long-term Chinese nuclear

---

[72] Cited by William, p. 60.

[73] Trevedi, p 195, (also see his remarks in the introduction of the book at p. xxxv).

[74] Mrs. Gandhi cited in, Ashis Nandy, 'Between Two Gandhis: Psychological Aspects of Nuclearization of India', _Asian Survey_, November 1974, p. 976.

[75] Ambassador M. Hussain cited by Williams, pp. 49-50.

threat played an important role in its rejection of the NPT and symbolized its resolve to develop a nuclear weapons capability. It indicates that not only the 'inadequacy' of security guarantees and 'discriminatory' nature of the NPT determined India's final attitude on these issues but China's development of nuclear weapons also proved decisive. Since its rejection of the NPT, India has refrained from participating in the NPT Review Conferences and continued to lament it as discriminatory. The 1979 annual report of the Indian Ministry of Defence (MOD) states: 'While nuclear non-proliferation is being preached to the world, additions to nuclear arsenals by some of the supporters of this policy are being reported'.[76] It suggested that India's opposition to the NPT was not only because of China's nuclear weapons capability but also based upon the vertical nuclear proliferation. It reflected an equal concern about general and complete nuclear disarmament. Above all, it wanted to retain its option to develop nuclear weapons as stated by Mrs. Gandhi and therefore, could not sign the NPT.

4. THE FIRST NUCLEAR DEBATE: 1964-68 TO 1974

The first public nuclear debate on the issue of India's acquisition of nuclear weapons was prompted by its military defeat in the 1962 conflict. It developed an intense momentum after the 1964 nuclear test by China and reflected sharp divisions within and outside the governmental decision-making echelons. It ranged from moderate to hawkish viewpoints and from benign neglect to emotional concern. The most unique position was taken by Krishna Menon who believed that the

[76] Annual Report 1979-80: Ministry of Defence, Government of India (New Delhi, GOI, 1980), p.2.

debate on India's acquisition of nuclear weapons was harmful.[77] He stated, 'the lack of understanding is revealed by the very debate which is now taking place on the atom bomb', and described it as a debate of "mass extermination".[78] Menon was known for his opposition to India's development of nuclear weapons. The most articulate support for an open commitment to the development of nuclear weapons came from the Atomic Energy Establishment headed by Dr. Bhabha. He became vocal after the Chinese nuclear test and openly advocated an Indian nuclear deterrent.[79] As noted earlier, he immediately called a press conference after the Chinese test and pronounced that India was capable of carrying out a nuclear explosion within 18 months.[80]

Bhabha might have been right only in terms of mastering the technology of a nuclear explosion. But given India's scarce accumulation of plutonium from its only operational reactor, CIRUS, his statement was an exaggeration.[81] Bhabha also argued favourably about the economic feasibility of an Indian nuclear deterrent in view of the investment which had already been made on the Indian nuclear programme. Shastri's government did not repudiate Bhabha's economic argument but tried to distance itself from his stance as a matter of official policy.[82] Bhabha's successor, Dr. Vikram Sarabhai, was initially less inclined towards India's development of a nuclear deterrent and did not believe in

---

[77] Brecher, *INDIA AND WORLD POLITICS: KRISHNA MENON'S VIEW OF THE WORLD*, p. 228.

[78] ibid. pp. 228 & 313.

[79] See notes 7 & 8.

[80] ibid.

[81] See notes 12 and 18.

[82] Lok Sabha Debates, 1964 Vol. XXXV, pp. 1546-50.

continuing the SNE Project.[83] He was skeptical about its capability to do so in the immediate future as claimed by Bhabha and believed it "unwise" to commit national resources in that direction, as a matter of urgent priority.[84] It indicated that Bhabha's economic argument in favour of the development of an Indian nuclear deterrent was questionable.

A survey of Parliamentary Debates indicates that there was a lack of consensus within the Shastri government on two central nuclear issues, the nature of the Chinese nuclear threat and whether the development of nuclear weapons was possible in the immediate future. The Ministry of External Affairs (MEA) continued to raise concerns in the Lok Sabha about the foreign policy implications of the shift in Indian nuclear policy and a contradiction it would create with its commitment to nuclear disarmament.[85] However, the MEA did inform the Lok Sabha in May 1966 that the policy on the acquisition of nuclear weapons was under review.[86] The Ministry of Defence (MOD) was also against an immediate change in nuclear policy since it was preoccupied with gradually increasing conventional military expenditure.[87] Existing threats were entirely conventional at that time, and so, the diversion of funds might have undermined the conventional military capability.[88] In short, the Ministries of Foreign Affairs and Defence both considered a nuclear threat to India as distant and therefore, required a long-term response. May

---

[83] TIMES OF INDIA, 2 June 1966. It was confirmed by K. Subrahmanyam in his interview on 22 November 1988.

[84] ibid.

[85] Lok Sabha Debates, 1965, Vol. XXXIV. pp. 1306-08, Vol. XXXV, pp. 1546-54 and Vol. XXXVII, p. 5841.

[86] Lok Sabha Debates, Vol. LV, 11 May 1966.

[87] Lok Sabha Debates, 1965, Vol. XL, pp. 6319.

[88] ibid.

be they felt that despite the threat, there was little they could do in the short-term except explore security guarantees.[89] The atomic energy establishment led by Bhabha, as noted above, wanted an immediate commitment to the development of nuclear weapons.

The nuclear issue remained largely dormant on the agenda of Indian political parties before 1964. The only exception was an orthodox Hindu party, Jan Sangh, whose manifesto proposed acquisition of nuclear weapons because it viewed India as a great power for which nuclear weapons were essential.[90] After China's nuclear test, Jan Sangh vigorously demanded an Indian nuclear deterrent.[91] The Swantantra Party was in favour of a nuclear security guarantee from the U.S. In case this was not available, it recommended a recourse to the development nuclear weapons.[92] Its General-Secretary, who was a member of Parliament, M.R. Masani, expressed his skepticism over the viability of non-alignment and challenged non-violence as a precept for a country like India whose approach needed to be strategic.[93] He refused to recognize the fundamental difference between nuclear and conventional weapons by saying that both were violent and it was only a matter of degree, not a principle.[94] The Praja Socialist Party, which considered India as a potential great power, saw the acquisition of nuclear weapons an imperative for achieving that

---

[89] See Section 2 above.

[90] M.A. Kishore, *JAN SANGH AND INDIA'S FOREIGN POLICY* (New Delhi, Associated Publishing House, 1969), pp. 125-135.

[91] Mirchandani, p. 32.

[92] Lok Sabha Debates, 1964, Vol. XXXV,,pp. 1236-40.

[93] ibid.

[94] ibid.

potential.[95] The party secretary emphasized the imperative of acquiring self-reliance in the manufacture of nuclear weapons to enhance India's national prestige and great power status.[96] He too, like Mr. Masani, questioned the relevance of Ghandian philosophy of non-violence to the nuclear debate and demanded a strategic approach.[97]

The Communist Party was against India's acquisition of nuclear weapons as well as nuclear security guarantees from Western states, but it was divided on the perception and nature of nuclear threat from China.[98] The pro-Soviet faction castigated the Chinese nuclear test and acclaimed the Indian government's restraint for not being driven towards the development of nuclear weapons and for its overall stance on nuclear disarmament.[99] The pro-China faction believed that China's nuclear test was meant to enhance its capability against the U.S. imperialism, the Soviet imperialism, and not against India.[100] Therefore, there was no need for undue apprehensions and change in the Indian nuclear policy. The position of the Indian National Congress was much closer to the government's line. However, in its session at Durghapur, it demanded that the government's policy of not making nuclear weapons should be reconsidered. Otherwise, its role remained confined to mostly domestic political affairs.[101]

---

[95] M.R. Dandavate, 'Chinese Nuclear challenge to Indian Democracy' in, A.B. Shah (ed.), *INDIAN DEFENCE AND FOREIGN POLICIES* (Bombay, Manaktalas, 1968), pp. 133-35.

[96] *ibid*.

[97] *ibid*, p. 134.

[98] Mirchandani, p. 32 and Shah, PP. 166-67.

[99] *ibid*.

[100] Shah, pp. 136-37 & 167-69.

[101] S.A. Kochanek, *THE CONGRESS PARTY OF INDIA* (Princeton, Princeton University Press, 1968), p. 9.

India's strategic elite was divided into two lobbies over the debate on nuclear weapons. A survey of the Indian literature on nuclear debate reflects that majority of the Indian strategic elite believed that India's foreign and security policies lacked a strategic perspective which was essential for a country of its size and power potential. Raj Krishna, a former civil servant, was vocal in his demand for an Indian nuclear deterrent against China. He openly advocated the development of a limited nuclear deterrent by India.[102] He recommended that India should seek nuclear security guarantees from the superpowers for not developing strategic (nuclear) deterrence but should still develop tactical deterrence.[103] His views were unique in the sense that he did not realize that the two approaches might not be practicable at the same time. Sisir Gupta also advocated the development of an independent nuclear deterrent.[104] He suggested that Indian diplomacy should focus on persuading the great powers that a Sino-Indian strategic balance was in their interests as well. He pleaded for a nuclear weapons force capable of engaging targets easily accessible in China, like oil and military installations in Tibet and Sinkiang, without suggesting where such a nuclear force would be deployed.[105]

A study written under the auspices of the Institute of Defence Studies and Analyses (IDSA) demanded a credible posture against the Chinese nuclear threat. According to this study, basic Chinese motivation in developing a strategic

---

[102] Raj Krishna, 'India and the Bomb' India Quarterly, April-June 1965, p. 122.

[103] ibid.

[104] Sisir Gupta, 'Indian Dilemma' in, Alastair Buchan (ed.), A WORLD OF NUCLEAR POWERS (New Jersey, Prentice-Hall, 1966), pp. 60-65.

[105] ibid.

nuclear capability was to intimidate neighbours like India.[106] K. Subrahmanyam rejected a nuclear umbrella for India by contending that if the U.S. with its overwhelming strategic capability did not feel secure, the Indian population or the government is not likely to feel secure with security guarantees.[107] He suggested a 'credible posture' which would require nuclear and thermonuclear warheads, strategic bombers, a missile-based delivery system including nuclear submarines, and command, control and communication (C^3) network to operate the entire system.[108] This posture was to be a long-term strategic plan for an independent nuclear deterrent rather than an immediate programme.[109]

Many other vocal elements of the Indian strategic community were demanding the development of nuclear weapons. In fact, there were demands from various sections of the Indian polity that India should respond to the Chinese development of nuclear weapons by developing a nuclear deterrent. In an opinion survey conducted in 1969-70, 80 % of the Indian strategic elite was actively interested in the nuclear debate.[110] According to the survey, 38 % of those who were interviewed wanted India to develop a nuclear bomb, 58 % were opposed and 4 % were indecisive.[111] However, the interviewer found that those who opposed the development of the

---

[106] K Subrahmanyam, *A STRATEGY FOR INDIA FOR A CREDIBLE POSTURE AGAINST A NUCLEAR ADVERSARY* (New Delhi, IDSA, 1968), pp. 5-8.

[107] ibid, p. 6.

[108] ibid, 6-7.

[109] ibid.

[110] Nandy, pp. 967-68.

[111] ibid.

bomb were 'amenable'.[112] According to the survey, 81 % opposed India's adherence to the NPT.[113] He further observed that,

> Given that a majority of these respondents opposed nuclear armaments for the country and yet thought rather poorly of the NPT, perhaps the only way the Indian leadership could forge a national consensus or for that matter a consensus within the ultra-elite, was by flouting the NPT and, simultaneously carrying with them the opponents of the bomb (by stressing the peaceful aim of the explosion), by drawing a line between nuclear powers and nuclear weapon powers and by pledging not to produce nuclear armaments.[114]

The nuclear debate between 1964 and 1968 was intense and emotional. At times, it lacked sophistication in strategic argument and appeared devoid of hard-core thinking about the nature of the nuclear deterrent being suggested and its structure except in few cases. There was no indication of the doctrines to govern the deployment of the deterrent force and the probable implications of that deterrent in and outside the region. However, the 1964 to 1968 debate appears as a period of gestation which produced a strategic rationale for the 1974 nuclear test.

After the 1974 Indian nuclear test, the pro-bomb lobby was divided into two schools of thought, one favouring a crash programme for developing a nuclear force and the other suggesting a moderate nuclear military response graduated to the perceived threat. There were continuous shifts of opinion within each of the two schools. The hawkish school was led by Subramanian Swamy and it favoured more nuclear explosions immediately after the 1974 test. Mr. Swamy recommended the production of nuclear weapons on a crash basis. In an article in 1974, Swamy spelled out his plan for two alternative

---

[112] ibid.

[113] ibid.

[114] ibid.

strategies for India to pursue for the development of a nuclear force.[115] First, it could set off more 20 KT nuclear explosions immediately, and thereafter produce a medium size force consisting of IRBMs (about 100 plutonium bombs) over the next five years.[116] He proposed a simultaneous initiation of research and development on ICBMs, H-Bombs, Satellites and thorium technology. At the end of five years, he suggested a reassessment in order to determine whether the 'weapons-mix' needed to be shifted towards ICBMs and H-Bombs in hardened sites. According to his second (alternative) strategy, he advocated that India could straight away go for the development of ICBMs and thermonuclear warheads even if it took ten years to produce a force.[117]

The moderate school was initially led by K. Subrahmanyam. He argued that there was no immediate nuclear threat to India but perceived a long-term threat, to which he preferred a measured response. After the 1974 test, he stated,

> On the other hand the moment of decision (going for the production of nuclear weapons) for India has not yet come and it will only come in the next four to five years when the necessary investment decisions will have to be made. At the present, all that has been done may amount to enlarging the Indian option towards a weapons programme. There is no need to superficially exercise that option till the country passes the experimental stage and will need to invest on the production of nuclear warheads and delivery vehicles.[118]

Subrahmanyam's opinion helps in understanding the official

---

[115] Subramanian Swamy, 'A Weapons' Strategy for Nuclear India', _Indian Quarterly_ XXX (4), October-December, 1974, pp. 272-275.

[116] _ibid_, pp. 275-76.

[117] _ibid_.

[118] K. Subrahmanyam, 'The Indian Nuclear Explosion and its Impact on Indian Security', _India Quarterly_ XXX (4), (October-December 1974, p. 255.

approach to manage the issue of India's acquisition of nuclear weapons because of his close association with the decision-making hierarchy in India. Subrahmanyam gradually became an ardent advocate of India's acquisition of nuclear weapons in the 1980s.[119]

The debate developed an element of openness which was uncharacteristic of the Nehru era. The ascendancy of a politico-diplomatic strategy without a comparable military strength which was the hallmark of Nehru's approach, became redundant. Thereafter the focus shifted to the development of military capability as a preponderant element of national power. Simultaneously, some information about the military undercurrents of India's nuclear capability was divulged during the debate on acquisition of nuclear weapons. It became difficult to maintain Nehru's rule of secrecy on the nuclear decision-making process because the debate was not merely confined to the extra-governmental level. Various intra-governmental groups became involved in the public argument. A survey of this debate indicates widespread support for India's development of nuclear weapons and against reliance on the great-powers for India's security. Indian policies of self-reliance in all the fields of national activity had always enjoyed public support and the development of a nuclear weapons capability was no exception. There was a broad consensus in India about a Chinese nuclear threat which gradually receded. The public mood shifted to India's assumption of a role according to its size and power potential so that it could counterpoise China's influence in South Asia. From a long-term perspective, India had always viewed for itself a leadership role in Asia which is comparable to China. The fact, that India is a democratic polity as compared with the authoritarian nature of the Chinese system, went to its

[119] ibid.

advantage in visualizing such a role. At the same time, successive Indian governments had to take due notice of the domestic public opinion because of their representative character. They could not ignore the public pressure on various issues related to the acquisition or non-acquisition of nuclear weapons, like the nuclear security guarantees and the NPT. In brief, the role of domestic pressure groups about the nature of threats to India and demands for an adequate response cannot be ignored. It equally played its due role on the issue of development of nuclear weapons capability by India. Indian governments have shown sensitivity about the public pressure on this issue.

5. MRS. INDIRA GANDHI'S PURSUIT OF A NUCLEAR WEAPONS CAPABILITY

It is generally contended that Mrs. Indira Gandhi cancelled her predecessor's decision to carry out the SNE Project, and the 1974 Indian nuclear test was the result of her own ingenuity rather than a logical culmination of the previous government's policy. On the contrary, this study suggests that, given the continuity and coherence as essential hallmark of Indian nuclear policy since the Nehru era, the 1974 Indian nuclear test was its logical, albeit delayed outcome. The test did not take place until 1974 because Mrs. Gandhi had no choice but to postpone the SNE project due to political expediency, strategic imperatives and technological constraints. She took over the government in early 1966 and needed time to reconsider the entire spectrum of India's domestic, regional and international policies. Bhabha's death slowed the technological momentum and the project was put on the shelf until she could complete a re-evaluation and organize a new team. The next Chairman of the AEC and Secretary of the DAE, Dr. Vikram Sarabhai, was not amongst Bhabha's close confidants and not a supporter of the pro-bomb lobby.[120] The pro-bomb lobbyists were not politically close to Mrs. Gandhi, and her favourites from the bureaucracy like Dr. Sarabhai and L.K. Jha were initially inclined to favour nuclear security guarantees.[121]

The postponement of that project was also necessitated by the dynamics of intra-governmental politics. Indian political elite and bureaucracy at that time were divided on two fundamental issues, whether to accept nuclear security guarantees from the great-powers against the Chinese nuclear threat or to develop an indigenous nuclear deterrent.[122] The bureaucracy at large and the Indian National congress were against India's acceptance of nuclear security guarantees.[123] The intensity of domestic political pressure which resulted from the nuclear test by China in 1964 had also subsided to some extent.[124] Mrs. Gandhi was personally in favour of retaining the nuclear option but in a way that would not alienate her supporters at that stage of her political career. She therefore, decided to postpone the project.

This leads to an obvious question: why the test was not carried out between 1968 to 1970, or 1971 to 1973? There are various political, strategic and technological reasons to believe that it was not possible before 1974. First, as noted earlier, Shastri and Bhabha died in 1966 which disturbed the momentum of technological development and delayed the pro-

---

[120] See notes 83 and 84.

[121] Noorani, pp. 488-92.

[122] These two issues are discussed in detail by Michael Brecher, _NEHRU'S MANTLE: THE POLITICS OF SUCCESSION IN INDIA_, pp. 110-130 and Kapur, _INDIA'S NUCLEAR OPTION: ATOMIC DIPLOMACY AND DECISION MAKING_, PP. 145-164.

[123] _ibid_.

[124] _ibid_.

ject. Second, Mrs. Gandhi needed time to take stock of the entire spectrum of India's domestic, regional and international politics. It needs to be kept in mind that on 27 May 1964, when her father Pandit Nehru died, she had not yet established her credentials as a candidate for succession. She lacked experience in government and had not demonstrated that charismatic dynamism and political acumen which she later displayed. She was nominated a member of the Working Committee of the Indian National Congress at the time of Nehru's death.[125] She became the Minister for Information and Broadcasting in Shastri's Cabinet in 1964 and was elected to the Rajya Sabha (Upper House of the Indian Parliament). She was the first Indian Prime Minister elected by the Parliamentary Party of the Indian National Congress through a secret ballot rather than the principle of consensus.[126] Her election against Mr. Morarji Desai was based upon political opportunism by the party bosses to win the next elections in 1967 by exploiting the Nehru legacy. Politically, the Indian National Congress needed her badly in view of its tarnished image after the 1962 military defeat by China. The Congress won the elections in 1967 with a majority of 24 in the Lok Sabha but lost power in five states.[127] The party bosses also thought, though quite erroneously, that Mrs. Gandhi could be more easily manipulated than Morarji Desai.[128]

Despite Mrs. Gandhi's apparent decision to postpone the SNE project in 1966, the continued concern by the U.S.

---

[125] Nayantara Sahgal, *INDIRA GANDHI: HER ROAD TO POWER* (London and Sydney, Mcdonald and Co, 1982), pp. 4-5.

[126] ibid, p. 12.

[127] ibid.

[128] The details of the in-fighting in the Indian National Congress at that time are described by Trevor Drieberg, *Indira Gandhi: A Profile in Courage* (New Delhi, Vikas Publications, 1972), pp. 60-65.

administration in 1966 indicated that in its perception the direction of the Indian nuclear programme was moving towards the development of a weapons capability. This is evident from a Background Paper for the U.S. President, Lyndon B. Johnson, on the visit of Mrs. Gandhi to the United States in March (28-29) 1966.[129] The Paper highlighted the possibility of India's acquisition of nuclear weapons from the standpoint of security, domestic politics and prestige.[130] An additional note in the memorandum for the President recommended that he suggest to the Indian P.M. that if India perceived a serious nuclear threat from China, 'she will frankly discuss the question with us so that we could examine together possible means to meet that threat without nuclear proliferation' rather than India undertaking the heavy economic and other burdens of a nuclear weapons capability.[131] In the 558th National Security Council Meeting in June 1966, the U.S. President expressed his concern about 'India favoring the nuclear route' under the growing pressures and stressed that, 'its own economic progress and the stability of the whole area depended on India not going nuclear'.[132] The Vice-President emphasized: 'how little additional expenditure would be necessary beyond that already invested for India to go nuclear' and suggested a U.N.

---

[129] Visit of The Prime Minister Indira Gandhi of India, March 28-29, 1966: Background Paper on The Indian Nuclear Policy, dated March 16, 1966, NATIONAL SECURITY FILE, COUNTRY FILE - INDIA, Lyndon B. Johnson Library, Texas.

[130] ibid.

[131] Memorandum for the President from Dean Rusk: Visit of Prime Minister Indira Gandhi of India; a note on India's Nuclear Policy, dated March 21, 1966, NATIONAL SECURITY FILE, Country File -India, Lyndon B. Johnson Library, Texas.

[132] SUMMARY NOTES OF 558th NSC MEETING: The Problem of Indian Nuclear Weapons, June 9, 1966 declassified NLJ 90-114 dated 7-16-90.

umbrella with private U.S. reassurances to India.[133] Given the reliability of U.S. information collection systems, its concerns about India's pursuit of a nuclear weapons capability cannot be disregarded.

Mrs. Gandhi reiterated her government's interest in the development of nuclear explosions in 1968. As noted in the section on the NPT, the Indian government openly declared in the late 1969 that the development of "peaceful nuclear explosives" was an important objective of Indian nuclear programme. Mrs. Gandhi continued to criticize the NPT regime and its sponsor states in a way which indicated the nature of the issues at stake. She said,

> The problem of insecurity cannot be solved by imposing arbitrary restriction on those who do not possess nuclear weapons, without any corresponding steps to deal with the basic problem of limiting stockpiles in the hands of a few powers. <u>How can the urge to acquire nuclear status be controlled so long as this imbalance persists</u> (emphasis added).[134]

It suggested that Mrs. Gandhi considered the acquisition of nuclear weapons as a symbol of great-power status and believed that arbitrary limits were being imposed by the nuclear weapon states. India's interest in the PNEs seemed to be motivated by its dual-use potential. George H. Quester aptly described the Indian nuclear posture in the late 1960s within which a weapons capability was designed:

> A project for a "peaceful nuclear explosion" (to avoid seeming bellicose), underground (to avoid violating the test-ban treaty which India did sign) with plutonium as the fissile material (to avoid great expenditure) thus may win whatever support it needs among both scientists and politicians. Among Indian public officials known to be opponents of

---

[133] <u>ibid</u>.

[134] Indira Gandhi, <u>*INDIA: THE SPEECHES AND REMINISCENCES OF INDIRA GANDHI; THE **PRIME MINISTER OF INDIA***</u> (London, Hodder and Stoughton, 1975), p. 127.

> nuclear weapons in 1968 almost none were prepared to rule out peaceful explosive devices along with explicit weapons.[135]

By 1970, it had become obvious that India was involved in the process of developing nuclear explosives technology. It launched an ambitious nuclear energy and space research plan which emphasized the development of technology for underground 'peaceful nuclear explosions'.[136] With that plan, the emphasis on the development of technology for peaceful nuclear explosions became a recurrent theme in Indian policy statements on atomic energy. In November 1970, the U.S. administration sent an *aide-memoir* to the Indian government, stating that it would consider the use of U.S. supplied materials and assistance for the development of nuclear explosive devices a contravention of the terms of the Indo-U.S. Agreements of 1956 and 1963.[137] It demanded formal assurances against the use of those materials for manufacturing nuclear devices.[138] India informed the U.S. that it did not accept in principle the American interpretation of the above agreements.[139] However, the U.S. was privately assured that India would not use the materials provided under the above

---

[135] Quester, *THE POLITICS OF NUCLEAR PROLIFERATION*, p. 72.

[136] Atomic Energy and Space Research: A Profile for the Decade 1970-80 (New Delhi, GOI, 1970), pp. 1-15.

[137] The details are discussed in the text of the Statement Before The House of Representative's Committee on Foreign Affairs, Concerning Nuclear Exports to India, by James N. Barnes and S. Jacob on Behalf of The Natural Resources Defense Council, National Audubon Society, Union of Concerned Scientists, Sierra Club, and Friends of The Earth, dated 23 July 1980, p. 6.

[138] ibid.

[139] Wohlstetter, pp. 118-19.

agreements for producing nuclear devices.[140] Eventually, as will be seen later, India actually used the U.S. supplied material for its 1974 nuclear test.

The 1970 political crisis in Pakistan and the immediately preceding period contributed to the delay in carrying out the nuclear test earlier than 1974. The developments since the overthrow of General Ayub's government in Pakistan in March 1969, the imposition of martial law and the uprising in East Pakistan (now Bangla Desh) kept the Indian government fully preoccupied with that crisis. It was only after the 1971 Indo-Pakistan war that Mrs. Gandhi could take up the issue again. The victory in war against Pakistan generated a power-psychosis and provided a stimulus to carry out the test and demonstrate the development of a nuclear weapons capability. According to Bhabani Sen Gupta,

> India's military victory in the Bangladesh war of 1971 produced a paradoxical impact on the nuclear debate. The image of India as a major or dominant power whetted the appetite for the bomb.[141]

In some circles, the 1970-71 victory rejuvenated the nostalgia of "Maha Bharata" (Great India). The urge to project a great-power image was irresistible across the Indian polity. A manifestation of that is apparent from a statement made immediately after the 1971 Indian victory which indicates the psychological frame in which Indian nationalist thinking was cast. It says,

> From now on it would be necessary to seek out spheres of influence, to outflank and corner potential adversaries and to build a kind of political and diplomatic thrust which tastes of a major power status.[142]

---

[140] ibid.

[141] Gupta, p. 3.

[142] ibid, p. 5.

In all probability, the decision to carry out the 1974 nuclear explosion was made in April 1972, in the aftermath of the December 1971 victory.[143] Mrs. Gandhi gave approval to the DAE for the preparatory work under the supervision of a committee which included Dr. Homi Sethna, the Chairman of the AEC and Dr. Raja Ramanna, the Director of the BARC.[144] The technological base to carry out the theoretical calculations for a nuclear explosion was laid through the commissioning of a 10 MW research reactor (PURNIMA) in May 1972. By then India had also accumulated about 112.8 kg of plutonium from CIRUS (India's only safeguards-free reactor operational at the time except Tarapur reactors which are under safeguards).[145] After carrying out the requisite theoretical calculations, preparing the implosion mechanism and calibrating the measuring instruments, the committee reported to the Prime Minister, Mrs. Gandhi, in February 1974 that the preparations were complete.[146] The completion of preparations coincided with Mrs. Gandhi's sudden political downfall due to infighting within the Congress Party, malfunctioning of the economy and the country-wide railway strike. The exact timing of the detonation on 18th May 1974 was therefore, most likely determined by immediate domestic considerations which might have prompted her to improve her image by fixing the D-day. Before the test, the Indian government launched a well orches-

---

[143] Stephen M Meyer, _THE DYNAMICS OF NUCLEAR PROLIFERATION_ (Chicago, University of Chicago Press, 1984), pp 123-24, and Bhatia, pp. 144-45.

[144] Bhatia, pp. 144-45.

[145] As noted earlier CIRUS reactor, operated in 1960, has a 9.4 kg plutonium production capacity per year. By 1972, it had produced approximately 112.8 kg of plutonium.

[146] Mitchell Reiss, _WITHOUT THE BOMB: POLITICS OF NUCLEAR NON-PROLIFERATION_ (New York, Columbia University Press, 1988), p. 228.

trated publicity campaign to highlight the utility of a PNE.

According to a WASHINGTON POST report, quoting Senator Henry M. Jackson, India tried unsuccessfully to detonate a nuclear device in February 1974 (three months before the May Test).[147] The report stated that the abortive attempt was detected by U.S. military seismic detectors but U.S. authorities neither attempted to stop India from carrying out the May test nor revealed the development which took place in February.[148] As per another knowledgeable source, the U.S. AEC and the ACDA (Arms Control and Disarmament Agency) denied having any information about that development.[149]

On 18th May 1974 at 08.05 hours, (Indian Standard Time) India detonated a nuclear explosive device producing a yield between 10 to 12 KT (the lower limit of the yield was 10 KT).[150] The official Indian report stated that it was a successful experiment, designed to harness the peaceful uses of nuclear energy in the fields of subsoil engineering: diverting rivers and digging canals; oil and mines exploration; and blasting mountains.[151] The architect of the explosion, Dr. Raja Ramanna described similar objectives, stating that it was a step towards studying the fracturing effects on rocks, ground motion, containment of radio-activity and

---

[147] Thomas O'Toole, 'Early Try of Indian Bomb Told', WASHINGTON POST, 13 JULY 1974.

[148] ibid.

[149] Leonard S. Spector, *NUCLEAR PROLIFERATION TODAY*, pp. 37-38.

[150] R. Chidambaram and Raja Ramanna, 'Some Studies on India's Peaceful Nuclear Explosion Experiment', in *PEACEFUL NUCLEAR EXPLOSIONS* (Vienna, IAEA, 1975), IAEA-TC-1-4/19, pp. 423-24 & 429. Raja Ramanna was head of the Indian team which carried out the explosion and later became the Chairman AEC and Secretary DAE.

[151] Annual Report 1974-1975: Department of Atomic energy (Bombay, GOI, 1975), p. 7.

problems involved in post-shot access to the shot-point environment.[152] The explosion itself cost India $ 370,000 at the 1974 price index, excluding the cost of fissile material or the support infrastructure like running CIRUS, the PURNIMA research reactor and other directly associated projects which made the explosion possible.[153] Therefore, to rely on the above figure as a complete estimate of the 1974 nuclear explosion is elusive.

5.a. OBJECTIVES OF THE 1974 NUCLEAR TEST

Many explanations have been assigned to Mrs. Indira Gandhi's government for carrying out the 1974 nuclear test, ranging from an attempt to create a nuclear weapons option to the expansion of an existing option. Such explanations tend to ignore the fact that an option had already been created during the Nehru era which could have been expanded without carrying out the test. The real objectives of the 1974 nuclear test can be understood only if its precise status in terms of peaceful versus military or strategic applications is assessed. Mrs. Gandhi's interpretation of the 1974 test is noteworthy. In response to a question on NBC's Meet the Press programme in Washington that, "What is a peaceful nuclear explosion", she said,

> Actually the word I use is experiment, because that's what it was. We wanted to see whether by such an explosion or implosion---I don't know what the scientific term is---whether this can be used for purposes like making of dams up in the mountains or roads or something which otherwise is a very long

---

[152] R. Chidambaram and Raja Ramanna, pp. 423-25.

[153] Nature, vol. 250, no. 5461, July 1974, pp. 7-8. Full technical details of the 1974 explosion are discussed in, R. Chidambaram and Raja Ramanna, pp. 421-36.

and difficult process.[154]

There are too obvious discrepancies in the official arguments about the peaceful nature of the 1974 test. These become evident from the Indian government's report (cited above), statements of Mrs. Gandhi and the scientists who were in-charge of the explosion. Dr. Sethna was uncertain when asked a question after the explosion, "what peaceful application of that experiment he has in mind"?[155] He replied, "It is too early to give an indication, I would like to impress upon you that we are looking into it".[156] Dr. Raja Ramanna was relatively coherent and straight forward in response to a similar question, he answered in February 1981:

> My personal view is that PNEs (for major construction projects) will not be useful for the next 20 years. But in the next century, if one wanted to make a hole in 10 minutes or so, then there might be a case for one.[157]

These explanations not only differ from each other but the 1974-75 official report discussed earlier.[158] One may ask whether this was the result India had hoped to achieve from its nuclear test which was officially declared a success?[159] It indicated that neither the architects of that experiment nor their political patron had any definite peaceful application in mind before carrying out the test. There is no known project in India initiated before or after the 1974

---

[154] Indira Gandhi, *PRIME MINISTER INDIRA GANDHI: STATEMENTS ON FOREIGN POLICY* (New Delhi, Ministry of External Affairs, GOI, 1982), p. 67.

[155] J.P. Jain, *NUCLEAR INDIA VOL. 2* (New Delhi, Radiant Publishers, 1974), p. 334.

[156] *ibid*.

[157] *Nucleonics Week*, 18 February 1981, p. 14.

[158] See note 151.

[159] *ibid*.

nuclear test where the potential benefits from that experiment have been applied. At no stage from 1974 until today, has any Indian government been able to offer evidence of a project undertaken to justify the application of that "successful" experiment. In this case, Indian governments, which are usually responsive to international criticism of their policies, are not in a position to go beyond the oft-repeated rhetoric of a "peaceful explosion" to substantiate their claim by evidence.

The credibility of explanations offered by Mrs. Gandhi's government is undermined in view of the official and semi-official assessments of the Indian nuclear explosion by various governmental agencies of the United States and Canada which supplied the relevant nuclear materials to India. The official U.S. view was stated by U.S. Secretary of State, Dr. Henry H. Kissinger, during testimony before the Senate Committee on Government Operations in 1976. He stated,

> We deplored it strongly and we made it clear to India that we do not see the peaceful uses of nuclear energy in India that would justify the doubts and insecurities that have been raised (by the explosion).[160]

However, according to M. Brenner, the State Department proposal to condemn India for carrying out the test and apply immediate sanctions on nuclear exports to India was ruled out by Dr. Kissinger.[161] The U.S. administration came to the conclusion that contrary to its promises, India used the U.S.

---

[160] The response by Dr. Kissinger is contained in a Department of State letter written on his behalf by Robert J. McCloskey, the U.S. Assistant Secretary of State for Congressional Relations, to Senator Abraham Ribicoff, Chairman, Committee on Government Operations, United States Senate, dated June 2, 1976 (Washington DC, National Security Archives, 1989).

[161] M. Brenner, *NUCLEAR POWER AND NON-PROLIFERATION: THE MAKING OF U.S. POLICY* (Cambridge, Cambridge University Press, 1981), pp. 68-70.

supplied heavy water in CIRUS reactor to produce weapons-grade plutonium for the 1974 nuclear device. Dr. Kissinger confirmed that conclusion in a letter to the Chairman, Senate Committee on Government Operations (which carried out the investigation about the use of U.S. supplied material in 1974 test), Mr. Abraham Ribicoff. He wrote,

> As a result of your inquiry, I directed that there be a thorough review of earlier staff estimates. This review establishes that in earlier efforts the previously indicated heavy water loss rate and certain related calculations were incorrect. Consequently, there is high probability--- because of India's practice of co-mingling heavy water---that some U.S. heavy water remained in the CIRUS reactor during the period in question.[162]

There was also a widespread feeling of betrayal in the U.S. Congress. Many Congressmen believed that in contravention of its obligations for only peaceful uses, India used the U.S. supplied material for carrying out the nuclear explosion. During the course of investigation by the Senate Committee on Government Operations into the Indian nuclear explosion, Ribicoff noted,

> Furthermore, the underground testing of PNEs by the United States was completed in 1973, a year before India's explosion, by which time we had adopted the policy that nuclear explosions had no commercial, and therefore, no peaceful application.[163]

The U.S. Plowshares Project which originated in 1957 to study

---

[162] Letter from Henry H. Kissinger, Secretary of State, Government of the United States of America, Washington D.C. to the Abraham Ribicoff, Chairman, Committee on Government Operations, United States Senate, dated August 2, 1976. (*CONGRESSIONAL RECORD*), August 30, 1976, p. S14919).

[163] Indian Nuclear Explosion; Committee on Government Operations, United States Senate, Washington D.C., Press Release dated 11 June 1976, pp. 1-4.

the applications of PNEs had ended in 1970.[164] On the basis of those experiments, the U.S. concluded that PNEs were not a viable proposition.[165] The Indian government, which had shown interest in data about atomic explosions as far back as 1954 through Bhabha's queries to U.S officials, was aware of the U.S. results of the PNEs. A well documented study discloses that a confidential paper relating to "various affirmations of Indian interest in developing the technology of peaceful nuclear explosions" was handed over by the United States to the government of India on 18 November 1970.[166] In the period between 1970 and 1973, the United States and India held intensive negotiations on the peaceful and military scope, utility and implications of PNEs in the light of U.S. experiments.[167] The possibility that in 1973-74 India might be unaware that PNEs were not useful for civilian purposes is a remote one. However, India had a right, in principle at least, to disagree with the U.S. on the issue of PNEs.

According to the U.S. interpretation, India violated the Indo-U.S. Agreements of 1956 and 1963 in which it had undertaken that no material or equipment transferred to it by U.S. would be used for research and development of nuclear weapons, including a nuclear explosive device.[168] The

---

[164] Frank Banarby, *THE NUCLEAR AGE* (Cambridge Mass: MIT Press, 1974). pp. 105-110.

[165] ibid.

[166] N. Ram, 'India's Nuclear Policy: A Case-Study in the Flaws and Futility of Non-Proliferation' prepared for the 34th Annual Meeting of the Association of Asian Studies, Chicago, 2-4 April 1982, (unpublished). Please see Notes Part 1, note 6, p.1.

[167] ibid.

[168] Text of The Agreement For Cooperation Between The Government of The United States of America And The Government of India Concerning Uses of Atomic Energy, signed at Washington on 8 August 1963 and entered into force on 25 October

U.S. did not accept the Indian interpretation that its nuclear explosion had any peaceful applications.[169] It applied quiet pressure after the explosion by holding up further export licensing of fuel for the Tarapur atomic reactors in July 1974, pending satisfactory reassurances that the plutonium produced in these reactors would not be employed in the Indian nuclear explosives programme.[170] Initially, India refused to accept the U.S. demand. Dr. Homi Sethna wrote to his U.S. counterpart, Mr. Dixie Lee Ray, Chairman of the U. S. AEC on 10 July 1974, stating that,

> The Government of India regrets that it is unable to share the understanding of the United States Government expressed recently that, the use in or for any nuclear explosive device, or any material or equipment subject to United States Agreement for co-operation in Civil Uses of Nuclear Energy, is precluded.[171]

However, through protracted negotiations, the U.S. was able to obtain an understanding from India in 1980 that the U.S. fuel supplied to India would be used at Tarapur for the needs of the power station only, and not for any nuclear explosive device.[172]

The Canadian government's assessment of the 1974

1963. See Article 6.

[169] See notes 160 to 163.

[170] Details of the Correspondence are provided in the Statement of James N. Barnes and S. Jacob Scherr on behalf of the Natural Resources Defense Council, before the House of Representative's Committee of Foreign Relations on 23 July 1980, pp. 6-7.

[171] ibid.

[172] Text of The Testimony of Warren Christopher, Deputy Secretary of State Before The Senate Foreign Relations Committee and Senate Government Affairs Committee, dated 19 June 1980, p. 2. (Washington DC, National Security Archives, 1989).

Indian nuclear test also refuted the possibility of any peaceful application and considered it a functional equivalent of a weapon test. In a statement before the House of Commons, the Secretary of State for External Affairs, Honourable Allan J. MacEachen said,

> India's detonation of a nuclear explosive device in 1974 made it evident that Canada and India have taken profoundly differing views of what should be encompassed in the peaceful application of nuclear energy by non-nuclear weapon states. Canada is one of the earliest and most vigorous proponents of the Nuclear Non-Proliferation Treaty. A basic element of the Treaty, which guides Canadian policy in the field of nuclear exports and safeguards, is that it recognizes no technical distinction between nuclear explosives for peaceful and non-peaceful purposes.[173]

The termination of Indo-Canadian nuclear cooperation in 1976 and Indo-U.S. in 1985 illustrates the profound differences between India and its two principal nuclear suppliers about the nature, scope and dimensions of the 1974 test. It also indicated their differences about the nature of the Indian nuclear programme in terms of peaceful versus military uses.

A meticulously researched study by the Natural Resources Defense Council concluded: 'the Indian statement that its 1974 device was entirely indigenous and peaceful, sought to mask twenty years of U.S. and Canadian assistance to the Indian development of nuclear power'.[174] The label

---

[173] Nuclear Relations With India; Statement by the Secretary of State for External Affairs, the Honourable Allen J. MacEachen, in the House of Commons, 18 May 1976, pp. 1-2. (Washington DC, National Security Archives, 1989).

[174] Text of the Statement of James N. Barnes and Jacob Scherr on Behalf of the Natural Resources Defense Council before the House of Representative's Committee of Foreign Relations on 23 July 1980, p. 4. The Council was one of the petitioners in the hearing before the U.S. Nuclear Regulatory Commission for licencing nuclear fuel for the Indian Tarapur atomic reactors.

"peaceful" was intended to make it appear a low-risk measure and to appear less provocative to all the concerned parties. The policy was designed for the U.S. and Canada in particular whose material had been used in the test. Mrs. Gandhi's statement appears misleading and meant to conceal the true intentions underlying the explosion. Following Nehru's rule of secrecy, she also did not inform her cabinet about the explosion, except the Defence Minister. What were the high stakes if the test was a PNE, that she did not take her cabinet into confidence?

The contention that India did not build a nuclear arsenal after its 1974 nuclear explosion is often presented to justify its peaceful intentions. In the first place, the assertion has become doubtful in the light of a report which, quoting U.S. intelligence sources (two unnamed Reagan Administration officials and a State Department aide), claimed that India manufactured an unspecified number of low-yield nuclear devices between 1974 and 1977.[175] The report stated that Desai's government discontinued the process. There is no further information for academic analysis whether the nuclear weapons existed in a fully assembled form or as unassembled components. However, it is usually overlooked that India's stockpile of plutonium in the period (1974-1977) was too limited to launch a large-scale nuclear weapons programme. The only available source of plutonium was CIRUS, whose total accumulated stockpile of plutonium was 131.6 kg by 1974 and 159.8 kg by 1977.[176] The available plutonium stockpile therefore, could not sustain the large-scale production of nuclear

---

[175] Richard Sale, 'India Said To Be Building 20 Nuclear Weapons a Year', United Press International, 25 April 1988 (PM Cycle), Leonard S. Spector, *THE UNDECLARED BOMB*, p. 100, also note 95 (p. 362).

[176] It is worked out on the basis that the reactor CIRUS began operation in 1960. See appendices I & II for details.

weapons by India if its R & D requirements were taken into account. Above all, there was no imminent threat to justify an immediate production and deployment of nuclear weapons. India's pressing requirement for plutonium became apparent in 1977, when (according to a U.S. expert), an IAEA study known as Special Safeguards Implementation Report (SSIR) identified "material imbalances" at Tarapur atomic reactors, but the diversions could not be pinpointed.[177]

Additionally, a test alone could not be sufficient to develop a credible nuclear weapons deterrent. India had only mastered the technology to fabricate fissile-material and detonate a nuclear device. Full militarization of a nuclear weapons capability requires designing nuclear warheads, mating them with adequate delivery systems, and developing reliable command, control and communication (C^3) systems. India had not developed all of these sophisticated technologies by 1974. K. Subrahmanyam pointed out the difficulties in the Indian development of a full-scale nuclear weapons programme at that stage. He said,

> At the present all that has been done may amount to enlarging the Indian option towards a weapons programme. There is no need to specifically exercise that option till the country passes the experimental stage and will need to invest on the production of nuclear warheads and delivery vehicles.[178]

Therefore, it is difficult to accept the explanation at its face value that India did not produce nuclear weapons after

---

[177] Text of the Statement of Honorable Richard L. Otinger Before the Committee on International Relations, House of Representatives, dated 23rd May 1978, 95th Congress, 2nd Session, pp. 2-3. The case was also reported in Amrita Abraham, "Plutonium Missing from Tarapur Plant", SUNDAY OBSERVER (Bombay) 16-23, October 1983.

[178] K. Subrahmanyam, 'The Indian Nuclear Explosion and Its impact on Security', *India Quarterly*, XXX (4), p. 255.

the 1974 test because it was meant for "only peaceful uses" and India had no military utility in sight while planning the test. It appears that the 1974 explosion was meant to test the reliability of the nuclear device for a shift from a nuclear option to a weapons capability. Testing the device was a significant step forward in that direction. It underscored the fundamental and long-term politico-strategic objectives associated with that capability. However, the capability could still remain disguised by labelling the test as a PNE. A long-term but primary strategic objective of the nuclear test was to signal India's resolve to address its strategic concerns vis-a-vis the great powers.

As stated earlier, the Chinese nuclear weapons capability was perceived a long-term threat. Since the early 1970s, Indian government seemed to be seriously concerned about the gradually expanding nuclear weapons capability of China.[179] It took note of China's 11th nuclear test of approximately 3 megaton yield at Lop Nor on 14 October 1970 and the Chinese emphasis on developing 'ballistic missiles with nuclear warheads'.[180] India estimated that China had a nuclear capability of producing 40 weapons of 20 KT annually, with a total stockpile of 150 nuclear and a small number of thermonuclear bombs.[181] The main Indian concern seemed to be medium range Chinese ballistic missile (range up to 3200 km) which were not operational at that time but considered potentially 'capable of reaching targets in India from the launching bases in Tibet'.[182] However, the MOD report also noted that,

---

[179] Annual Report 1970-71: Ministry of Defence, Government of India (New Delhi, GOI, 1971), pp. 1-2.

[180] ibid.

[181] ibid, p. 2.

[182] ibid.

> While the nuclear capability of China, no doubt, constitutes an important factor in the total spectrum of threats to our security, its credibility has to be judged by several criteria such as the political or military advantages that may be derived from such an attack, its repercussions on the world situation, the reaction of other advanced nations and nuclear powers etc. The belief that nuclear weapons are an effective means of political blackmail does not at present appear to be well founded.[183]

It reflects that India perceived the Chinese nuclear weapons capability as a significant determinant of its long-term security environment, but not of immediate political or military implications. Therefore, there was no urgency for India to produce nuclear weapons in the short-term period. The threat required a long-term response of preparing a credible nuclear weapons capability based upon a tested device.

The 1971-72 Indian MOD report noted that 'China occupied its rightful place' as permanent member of the U.N. Security Council due to its strategic nuclear capability.[184] China launched its second earth satellite on 3 March 1971 which gave a boost to its ballistic missile capability. It carried further nuclear tests: 12th on 18 November 1971, 13th on 7 January 1972, and 14th on 18 March 1972 which significantly enhanced the capability of Chinese nuclear deterrent.[185] The report pointed out that Chinese views with regard to 'matters affecting the *inter se* relationship and internal affairs of the countries of the sub-continent' were unduly mentioned in the joint communique issued at the conclusion of

---

[183] ibid.

[184] Annual Report 1971-72: Ministry of Defence, Government of India (New Delhi, GOI, 1972), p. 9.

[185] Ibid.

President Nixon's visit to China.[186] It reflected India's concern that the U.S. endorsing of China's membership of the U.N. and letting its views reflected in the joint communique was a recognition of China's great-power status. Conversely, India felt being relegated to a lower status with the recognition of Chinese international and South Asian position. The 1972-73 Indian MOD report reiterated the concern about Chinese 'massive efforts to develop nuclear weapons and strategic delivery systems', and pointed out its 'refusal to join the preparatory Committee for World Disarmament'.[187] It further pointed out the Chinese 'noticeable tendency to take interest in the affairs of the Sub-continent to the detriment of the peace and cooperation enshrined in the Simla Agreement'.[188] It indicated an Indian interest to compete with Chinese influence in the region which India believed originated primarily from its nuclear weapons capability. The 15th nuclear test by China at Lop Nor on 27 June 1973 was seen by India as a further advance in its capability of "compacting thermonuclear warheads".[189] These reports suggest that Mrs. Gandhi's government was concerned about the gradually developing capability of China's nuclear force which enhanced its international power and regional status. That proved a significant impetus for India to take the road. Security, power and status appear as appropriate Indian rationale for an independent nuclear weapons capability to counterpoise China's increasing influence in the region.

A nuclear threat perception from the U.S., like the

---

[186] ibid.

[187] Annual Report 1972-73: Ministry of Defence, Government of India (New Delhi, GOI, 1973), p. 7.

[188] ibid.

[189] Annual Report 1973-74: Ministry of Defence, Government of India, (New Delhi, GOI, 1974), pp. 2-3.

one allegedly posed by the *USS Enterprise* in 1971 is also reflected in the Indian concerns as a rationale for developing a nuclear weapons capability. The 1971-72 MOD report stated,

> In the course of the war, a task force of the US Seventh Fleet consisting of *USS Enterprise*, the largest nuclear-powered aircraft carrier with nuclear weapons on board, a helicopter carrier, a missile destroyer and several other warships had been despatched into the Bay of Bengal. The instructions to the task force are shrouded in mystery; it is, nevertheless, clear that the intent was far from friendly.[190]

Admiral Shankar, Vice-Chief of Naval Staff and President of the prestigious United Services Institution (USI) of the Indian armed forces was more explicit:

> The memory of "exercise Enterprise" in 1971 should alert us to the danger that superpowers' nuclear threats are not necessarily confined to mutual deterrent postures; that in certain situations, that can be directed against us too.[191]

In 1973, the Indian government resented the presence of the U.S Seventh Fleet in the Indian Ocean.[192] The 1974 nuclear test signalled a low-key response that India had its own strategic objectives in the region which it might address through the development of a nuclear weapons capability. The test added weight to the credibility of that response as well as the capability.

An intermediate strategic objective of the 1974 nuclear test was to demonstrate a technological competence and the attendant politico-strategic capability. According to N. Ram, the success of the explosion was overstated to

---

[190] Annual Report 1971-72: Ministry of Defence, Government of India, p. 9.

[191] 'Nuclear Shadow Over The Subcontinent' *The USI* (United Services Institution), 9 April 1981, p. 2.

[192] Annual Report 1973-74: Ministry of Defence, pp. 3-4.

generate the desired political impact.[193] The Immediate official Indian statement about the 1974 'peaceful nuclear explosion experiment' stated a 15 KT yield but other versions contradict it as an exaggeration.[194] Actually, 2 kg of plutonium did not fission out of a total of 8 kg used in the device. However, irrespective of the officially stated objectives and the yield produced, the test indicated India's new politico-strategic ranking at home and abroad. Senator Ribicoff noted the impact, 'India thus became the sixth member of the nuclear weapons club because there is no technical difference between a so-called peaceful nuclear explosion and an atomic bomb.[195] Mrs. Gandhi might have seen a nuclear weapons capability based upon a tested device as an entry ticket for the great powers club which would enhance India's status in international and regional diplomacy.

The 1974 official Indian assessment recognized the obsolescence of the old strategic framework as it did not cater for the 'new realities of the subcontinent'.[196] India enjoyed good relations with the Soviet Union. later's supportive role in favour of India in the 1970-71 war further improved the relationship. The groundwork for that role had been prepared through the conclusion of Indo-Soviet Treaty of Peace, Friendship and Cooperation in August 1971. Article IX of the Treaty envisaged mutual consultations in the event of

---

[193] N. Ram, p. 5.

[194] Annual Report of the Department of Atomic Energy: 1974-75, p. 7. As noted earlier, Raja Ramanna, the architect of the 1974 test, stated the yield between 10 to 12 KT, "Some Studies on India's Peaceful Nuclear Explosion Experiment", pp. 421 & 434.

[195] Indian Nuclear Explosion, Committee on Government Operations, United states Senate, 1-4.

[196] Annual Report 1974-75: Ministry of Defence, Government of India, (New Delhi, GOI, 1975). p. 2.

an attack or threat of an attack on either party.[197] However, the management of the 1970-71 crisis with the Soviet support could be expected as one time exception, and might not be possible to repeat because of the volatile nature of world politics. A desire to be independent from collective security framework and India's own management of South Asian affairs to the exclusion of the superpowers, cannot be ruled out as an underlying objective of the 1974 test. It also reflected India's determination that its opposition to the NPT was not merely an exposition of an abstract principle but a practical necessity dictated by the Indian national interests.

The decision to carry out the test in May 1974 also appears to be closely associated with the dynamics of Indian domestic politics. In the first place, the development of Indian nuclear capability has operated within a supportive domestic political environment. Its strongest base has been, and remains, a well organized and articulate pro-bomb lobby. The most significant components of the pro-bomb lobby came from the nuclear establishment, retired and serving civil servants and political parties.[198] Its institutional base has been officially cultivated and consistently patronized by the Indian government, like establishment of the Institute of Defence Studies and Analyses which is a premier think tank in favour of India's acquisition of nuclear weapons.[199] Since its establishment, this Institute, as a matter of collective policy and its staff members individually are the staunch protagonists of the bomb.

An opinion survey of the Indian strategic elite

---

[197] Annual Report 1971-72: Ministry of Defence, Government of India, p. 5.

[198] See Section 4 above on domestic nuclear debate.

[199] This institute [IDSA] is financed and administered by Indian Ministry of Defence. This information is based on interviews and discussions with members of the institute.

after the 1974 test compiled by THE HINDUSTAN TIMES reported that 59.60 % of the respondents favoured India's development of nuclear weapons, 30 % opposed it and the rest were indecisive.[200] It was further reported that a majority of the strategic elite believed that the nuclear test had enhanced India's military and political position, and thereby strengthened its non-aligned status.[201] It also indicated that if the Indian government moved in the direction of producing nuclear weapons, the intelligentsia would support it.[202] According to the monthly PUBLIC OPINION SURVEY, opinion polls conducted immediately after the test reflected an upsurge in Mrs. Gandhi's personal popularity as well as her government and the Indian nuclear establishment.[203] The 1974 nuclear explosion partially satiated the pro-bomb lobby and ultra-nationalist elements who were critical of inaction on the nuclear front. By exploding the 1974 nuclear device, Indian government went a step ahead of the moderate faction of its strategic elite, but under a posture of ambiguity. An American official's comment on the policies of ambiguities followed by countries like India is noteworthy. He states,

> Though public opinion may be strong, the governmental military elite in some countries (e.g. India, Japan) is far ahead of the public. A nuclear decision may be made and advanced under the guise of a peaceful program while public opinion is shifting.[204]

---

[200] THE HINDUSTAN TIMES (New Delhi), 24 November 1975.

[201] Ibid.

[202] ibid.

[203] *PUBLIC OPINION SURVEY*, June 1974, pp. 4-6.

[204] R. Murray, Problems of Nuclear Weapons Outside Europe (Problem 2), NATIONAL SECURITY FILE, Committee File - Committee on Nuclear Weapons: INDIA, 7 December 1964, p. 3. Lyndon B. Johnson Library, Texas.

What the elite recommended publicly, the government of India appeared to reject in public, but adopted privately.

The texture of ambiguity surrounding the nature of the 1974 nuclear test was skillfully orchestrated to project an image of a nuclear capable India which could still deny the military application of the test. K. Subrahmanyam provides an indication about the objectives of the 1974 test:

> While India could maintain that it was a peaceful nuclear explosion, the overall significance of the test could not be lost on the big powers. Part of objective was to leave the future intentions of India ambiguous and thereby enlarge the country's options.[205]

The Indian nuclear option created in the Nehru era was in fact exercised in 1974. By declaring it peaceful, Mrs. Gandhi's government wanted to disguise its overt military manifestation. It was because of India's promises of "only peaceful uses" of the materials it received from the United States and Canada and actually used that material in the 1974 nuclear test.

A secret CIA Memorandum prepared in the immediate aftermath of the Indian nuclear explosion categorized India among the countries involved in attempts towards "weapons acquisitions".[206] It assessed the Indian status as a nuclear capable state; something functionally close to a nuclear

---

[205] K. Subrahmanyam, 'Indian Nuclear Explosion and Its Impact on Security', p. 257.

[206] Prospects For Further Proliferation Of Nuclear Weapons: A Secret CIA Memorandum No. DCI NIO 1945-74, dated 9/4/74 (S/NFD); declassified and transmitted under the Freedom of Information Act to Mr. S. Jacob Scherr, Attorney, International Project, Natural Resources Defense Council, Washington D.C. by the Information and Privacy Coordinator, Central Intelligence Agency, Washington D.C. vide letter dated 19 January 1978, pp. 1-2. (Washington DC, Files of the Natural Resources Defense Council).

weapon state.[207] The 1974 Indian nuclear device had two remarkable military oriented features, its design was based upon the implosion technique and its triggering package had a military connotation.[208] In the implosion technique (in contrast to the explosion technique), a hollow sphere of fissile plutonium is surrounded by a conventional high explosive specifically shaped in a way that when it detonates, it crashes inward or, in the technical language, "implodes" symmetrically and instantly, compressing the core of fissile plutonium to form a solid critical mass of explosive material. Additional spheres of natural uranium and beryllium are placed between the core and surrounding explosives (conventional). These explosives smash into the core during the process of implosion and reflect the neutrons back to improve the efficiency of nuclear reaction. According to a U.S. Congressional study, the 1974 Indian nuclear test demonstrated a capability which suggest a compactness and configuration close to a usable nuclear weapon.[209] A subsequent Congressional study (Up-date) on India's nuclear weapons capability established the same conclusion.[210]

The foregoing suggests that the 1974 nuclear test, based upon a dual-purpose technology, was a step towards the development of a nuclear weapons capability. It was actually planned by Prime Minister Shastri's government immediately after the Chinese nuclear test in 1964 as SNE Project, but could not be carried out because Shastri and Bhabha both died

---

[207] ibid.

[208] Analysis of Six Issues: Nuclear Capabilities of India, Iraq, Libya and Pakistan, p.36.

[209] Ibid.

[210] Mark Martel and Warren Donnelly, *INDIA AND NUCLEAR WEAPONS*; Environment and Natural Resources Policy division, Issue Brief Update 09/12/86, order code IB 86125 (Washington DC., Congressional Research Service, 1986).

in January 1966. That led to the breakdown of political and technological momentum for carrying out the test. Mrs. Indira Gandhi could not continue the technological momentum due to a wide range of political, strategic and technical variables affecting its progress. She resumed work on the SNE project after establishing her political credentials, and appraising the regional and international environment. She decided to go ahead with the test in the immediate aftermath of the victory in 1971 war with Pakistan. In April 1972, she gave permission to the DAE for making necessary preparations for the test. According to a WASHINGTON POST report, first attempt for the test failed in February 1974.[211] On 18 May 1974, India successfully carried out its nuclear test. As a result, it transformed the Indian nuclear option into a nuclear weapons capability.

[211] See note 147 above.

Chapter Five

PAKISTAN'S NUCLEAR POLICY AND ITS STRATEGIC INPUT INTO THE INDIAN NUCLEAR DECISION-MAKING

Pakistan's nuclear policy has proved a decisive input into the Indian nuclear decision-making process since the early 1980s. It has accelerated the development of Indian nuclear weapons capability and to a large extent, the strategy governing its possible employment. Conversely, Indian nuclear weapons capability, particularly the 1974 nuclear test, had a catalytic impact in generating a drive in Pakistan's for a nuclear weapons capability. Pakistan perceived a nuclear threat from the Indian nuclear weapons capability since the mid-1960s, but it was intensified by the 1974 nuclear test. Its threat perception was articulately expressed by Prime Minister Zulfiqar Ali Bhutto in the National Assembly of Pakistan.[1] He described the Indian nuclear test as a 'fateful development and a threat to Pakistan's security', and added: "A more grave and serious event has not taken place in the history of Pakistan. The explosion has introduced a qualitative change in the situation between the two countries".[2]

Mr. Bhutto dismissed Indian assurances provided in a letter from Mrs. Indira Gandhi that it had no military or political intentions in carrying out the 1974 nuclear explosion.[3] He argued that the real issue was not the intentions but the capability, particularly when a peaceful nuclear

---

[1] Z.A. Bhutto's statement in the National Assembly of Pakistan on 7 June 1974, THE PAKISTAN TIMES (Rawalpindi), 8 June 1974, p. 1.

[2] ibid.

[3] For details see, Dilip Mukerjee, 'India Nuclear Test And Pakistan', *India Quarterly*, XXX (4), October-December 1974, p. 262.

explosion (PNE) was not technologically different from a weapon test.[4] Mr. Bhutto emphasized to Mrs. Gandhi,

> Pakistan has a reason for unique anxiety because no two among the five nuclear-weapon states have ever been involved in the kind of confrontation and unresolved disputes which have bedeviled India-Pakistan relations.[5]

The perception of an Indian nuclear threat was not confined to political circles but the bureaucracy and scientific elite shared it with equal intensity. It triggered disturbing reactions in all sections of the body-politic in Pakistan. The Chairman Pakistan Atomic Energy Commission (PAEC), Mr. Munir Ahmad Khan, described the Indian nuclear explosion: 'A great blow, perhaps a fatal one to all the international efforts for containing and preventing the spread of nuclear weapons'.[6] He further stated that if India had justifiable economic or engineering reasons for a PNE, it could had been planned and conducted under the IAEA auspices.[7] Pakistan's Foreign Secretary, Mr. Agha Shahi, underlined the possible spill-over effects of the Indian nuclear test at the Geneva Disarmament Conference in June 1974 by stating, 'The road has been thrown open for the emergence of a seventh and an eighth nuclear power'.[8]

From a theoretical standpoint, Pakistan's nuclear response to the Indian nuclear test was immediately anticipated. A known nuclear specialist, James E. Dougherty dealt at length with the implications of the Indian nuclear test on

---

[4] ibid.

[5] ibid, pp. 262-63.

[6] THE PAKISTAN TIMES (Lahore), 29 September 1974, p. 1.

[7] ibid.

[8] Full text of Agha Shahi's statement at the Geneva Conference is provided in THE FINANCIAL TIMES, 13 June 1974.

proliferation of nuclear weapons.[9] He indicated its probable regional impact:

> Proliferation by reaction is a phenomena associated with pairs of conflict-parties or historic rivals rather than a chain-reaction involving indefinitely long series of countries. In 'Proliferation by reaction model', if one country acquire (nuclear weapons),the traditional foe feels itself under compulsion to acquire (nuclear weapons) for the sake of protective equilibrium.[10]

Dougherty contended that in reaction to the Indian nuclear test, Pakistan would feel compelled to develop its own nuclear weapons capability because of continued hostility with India.[11] In fact, Mr. Bhutto had already stated in 1965 while he was foreign minister in President M. Ayub Khan's government that, if India developed an atomic bomb, Pakistan too would develop one, "even if we have to eat grass or leaves or to remain hungry".[12] This statement was a reaction to nuclear development in India when P.M. Shastri decided in November 1964 to sanction the Subterranean Nuclear Explosive (SNE) Project and inaugurated the Trombay Reprocessing Plant in January 1965.

After the Indian nuclear test, Indo-Pakistani nuclear competition became intense. Since 1974, Indian and Pakistani nuclear programmes and policies have become inextricably linked into an 'action-reaction syndrome'. After the

---

[9] James E. Dougherty, 'Proliferation in Asia', _Orbis_, Fall 1975 (Special Issue), p. 926.

[10] _ibid_.

[11] _ibid_.

[12] Z.A. Bhutto, _AWAKENING THE PEOPLE: SPEECHES OF ZULFIQAR ALI BHUTTO 1966-1969_ (Rawalpindi, Pakistan Publications, 1970), p. 21. Bhutto's statement is also cited by a former Minister for Information and Broadcasting in his cabinet, Mr. Kausar Niazi, in his book (in Urdu language), _AUR LINE CUT GAEE [AND THE LINE WAS CUT]_ (Lahore, Jang Publications, 1987), p. 77.

Indian nuclear test, government of Pakistan lost no time in indicating its intentions, as to how it would respond to the nuclear threat it perceived. In an immediate reaction, the Chairman of the PAEC, Munir Khan categorically stated the Pakistani response:

> We have clear-cut policies and a programme which takes into account the interests of our country. Our policies are based on national requirements which take into account the Indian intentions. We need nuclear energy for our economic development, indeed for our very survival.[13]

For a better understanding of Pakistan's influence on the Indian nuclear decision-making process and nuclear weapons capability, it is relevant to explore Pakistan's nuclear programme and policy from historical perspective.

1. PAKISTAN'S NUCLEAR PROGRAMME

Contrary to India, which initiated its nuclear programme immediately after independence, Pakistan could not begin a well organized nuclear programme until the mid-1960s. The primary reason for such a late start was the early death of Mr. M.A. Jinnah, the founder of Pakistan, in 1948. Pakistan plunged into a perennial state of political instability after his death. The Pakistan Atomic Energy Commission was established as a semi-government organization in 1955. Its primary functions were spelled out by the first Chairman, Dr. Nazir Ahmad:

> i) planning and development of peaceful uses of atomic energy through the selection and training of personnel;
>
> ii) establishment of atomic energy and nuclear research institutes;
>
> iii) installation of power and research reactors;

---

[13] *Far Eastern Economic Review*, 27 May 1974, pp. 14-16.

iv) survey and procurement of nuclear materials; and,

v) application of radio-isotopes in agriculture, health and industry.[14]

However, the PAEC remained an ineffective and ill-planned body for almost a decade, due to a lack of political and economic support by the leadership, bureaucratic corruption and ineptness. Pakistan's nuclear programme showed a modest growth in the 1960s. Dr.I.H. Usmani became the Chairman of the PAEC. Its administrative structure was reorganized in 1965 and made a statutory institution. Throughout Ayub's regime, the PAEC remained committed to the peaceful uses of atomic energy and its programme was geared to that end alone. Until then, all the Pakistani nuclear facilities were placed under IAEA safeguards.

Pakistan's premier nuclear research establishment is PINSTECH (Pakistan Institute of Nuclear Science and Technology). Since its establishment in 1965, PINSTECH has grown into a multi-disciplinary institution and developed a firm technological base for various PAEC projects. Its major objectives are fourfold; **research** in nuclear science and technology, **development** for various applications of atomic energy, **training** in nuclear sciences and **production** of sophisticated equipment and special nuclear materials.[15] Through a sustained momentum of research and development and higher emphasis on self-reliance, PINSTECH has brought Pakistan closer to the goal of attaining full nuclear fuel

---

[14] Dr. Nazir Ahmad, 'The Atomic Energy commission', *PAKISTAN QUARTERLY*, X (2), Autumn 1957, pp. 14-16.

[15] PINSTECH 1965-1985, (Islamabad, Pakistan Institute of Nuclear Science and Technology, 1985), p. 3.

cycle capability.[16] It is one of the best nuclear research and development institutes in the Third World, like India's BARC, though the scope of its activities and support infra-structure is relatively smaller than the BARC. In the 1960s, PINSTECH sought collaboration from the U.S. Oak Ridge Nuclear Laboratory under a "Sister Laboratories" programme to acquire equipment and technological literature.[17]

Pakistan Atomic Research Reactor (PARR-1) is the centre-piece of the PINSTECH experimental facilities. It was commissioned in 1965 at Nilore near Islamabad, with an initial capacity of 5 MW capacity which could be updated to 10 MW without any major structural changes.[18] It is a swimming pool-type reactor established with the U.S. technical and financial assistance, uses demineralized water as a coolant and 90 % enriched uranium as a fuel.[19] It is under the U.S.-IAEA safeguards.[20] A number of instrumentation and control modifications have been recently carried out in PARR-1 by the PAEC experts to update its functions.[21] It has a wide range of uses, from R & D to the production of radio-isotopes for industrial, agricultural and medical purposes.[22]

---

[16] ibid.

[17] Warren H. Donnelly, Analysis of ERDA Information on U.S. Nuclear Assistance to Pakistan (Washington DC, CRS Memorandum, 27 December 1977), pp. 3-7.

[18] Annual Report 1973-74 (Islamabad, Pakistan Atomic Energy Commission, Government of Pakistan [hereafter GOP], 1974), p. 13.

[19] Office of Technology Assessment, *NUCLEAR PROLIFERATION AND SAFEGUARDS*, Appendix II, Part I, June 1977, Table B-1, p. 229.

[20] ibid.

[21] Annual Report 1985-86 (Islamabad, PAEC, GOP, 1986), p. 9.

[22] ibid.

Pakistan installed its first nuclear power station in 1972 at Karachi: Karachi Nuclear Power Plant (KANUPP), with a 137 MW (e) gross and 125 MW (e) net output capacity.[23] Canada provided financial assistance and the Canadian General Electric Company (GEC) built the reactor.[24] In the first two years of its operation, KANUPP achieved 70 to 75 % (per cent) availability factor and contributed 600 million KWH annually to the grid of Karachi Electric Supply Corporation raising the cumulative generation figure to 1.54 billion KWH.[25] It is a CANDU type heavy water reactor fuelled with natural uranium. The reactor is under the Canadian-IAEA safeguards and is capable of producing 30 kg of plutonium per year as a by-product.[26] When Canada terminated nuclear cooperation agreement with Pakistan in 1976, KANUPP suffered occasional stoppages due to various technological and spare parts constraints. The PAEC experts have been able to fabricate and commercially produce fuel for the KANUPP to ensure its continued operation after Canada stopped the supply in 1976.[27] However, the overall performance has not been good.

The search for nuclear fuel seems to be one of the major concerns of the PAEC. It maintains an Atomic Energy Minerals Centre at Lahore for this purpose. The main establishment at Lahore consists of five divisions: i) Planning and Development, ii) Prospecting, iii) Evaluation, iv)

---

[23] *SIPRI YEAR BOOK*, (Stockholm, Stockholm International Peace Research Institute, 1976), p. 30.

[24] ibid.

[25] Annual Report 1974-75 (Islamabad, PAEC, GOP, 1975), p. 4.

[26] Frank Banarby, *THE NUCLEAR AGE* (Stockholm, Stockholm International Peace Research Institute, 1974), pp. 70-71. The PAEC literature is silent about the plutonium production capacity of KANUPP.

[27] Annual Report 1985-86, pp. 1-4.

Drilling, and v) Mining.[28] It is supported by two outstation divisions; Mineral Sands Programme at Karachi and Hard Rock Division at Peshawar.[29] The PAEC annual reports indicate the existence of five major formations of uranium ore at: D.G. Khan, Hazara, Swat, Northern areas (Gilgit), and Kashmir (Pakistani part). It considers these deposits reasonably assured for the country's requirement.[30]

However, despite heavy emphasis on publicity of its efforts for uranium exploration and prospecting, reports of the PAEC are inexplicably silent on the quantum of uranium ore deposits in the country. Pakistan is not listed by the INFCE (International Nuclear Fuel Cycle Evaluation) among the countries with "reasonably assured" or "estimated additional" uranium sources. According to an independent source, its main reserves located at D.G. Khan are in the range of 100,000 tons.[31] In 1978, Pakistan reportedly acquired 100 tons of uranium oxide "yellow cake" from Niger through the Libyan connection and an additional consignment directly.[32] However, there is no accurate information about the quantity acquired from Niger directly. There is no mention about this in the PAEC's annual reports or any other relevant literature. (For further data on Pakistan's nuclear programme and its weapons capability, see appendices IX to X).

---

[28] ATOMIC ENERGY MINERALS CENTRE, LAHORE, a Hand Book of the PAEC, undated, Islamabad, p. 2.

[29] ibid.

[30] Annual Reports of the PAEC: 1973-1974 to 1975-1976 and 1980-1981 to 1986-1987.

[31] Nature, 18 September 1980, p. 181.

[32] Nuclear News, February 1980, p. 91.

1.a. PAKISTAN'S NUCLEAR PLANNING IN THE 1970s

When Pakistan launched its major nuclear programme in the mid-1970s, it ranked as one of the poorest and most underdeveloped countries of the world in terms of energy use. Its annual per capita energy consumption was equivalent to 150 KWH of electricity which was one-tenth (1/10) of the world average.[33] At that time, the world average of per capita energy consumption was 1500 KWH of electricity per year, the U. S. average was 10, 000 KWH per year and the average in Asian countries was 300 KWH per year.[34] In 1975, a joint IAEA and PAEC study proposed a minimum per capita energy consumption of 800 KWH of electricity for Pakistan by the year 2000, and recommended an increase in Pakistan's installed power capacity up to 23,000 MW (e) by that time.[35] The study concluded that Pakistan's conventional sources of energy were expensive as compared with nuclear power and therefore, unsuitable.[36] On the basis of the IAEA-PAEC study, Pakistan undertook an ambitious, "Optimum Power Generation Plan" as a long-term objective to meet the anticipated per capita energy demand of 800 kwh; 26 % of the country's total energy requirement.[37] It was to be generated by the installation of eight 600 MW nuclear power plants during 1981-90, and another sixteen 1100 MW plants during 1991-2000.[38]

---

[33] Nuclear Power For Pakistan (Islamabad, Pakistan Atomic Energy Commission, GOP, 1976), p. 1.

[34] ibid, p. 1.

[35] Market Survey For Nuclear Power In The Developing Countries (Vienna, International Atomic Energy Agency, 1975), pp. 6-7.

[36] ibid.

[37] Annual Report 1974-75, p. 4.

[38] ibid.

However, with its assessment of the Indian nuclear explosion as a 'weapon test', and the attendant perception of a nuclear threat or blackmail, Pakistan scrambled for the acquisition of a nuclear weapons capability. As noted earlier, Mr. Bhutto had vowed in 1965 that Pakistan too would acquire nuclear weapons if India produced an atomic bomb.[39] A study claimed in 1981 that after assuming power in 1971, Bhutto had called a secret meeting of the Pakistani nuclear scientists at Multan, and asked them to deliver the so-called "Islamic Bomb".[40] Bhutto had no doubt decided to embark on the process of acquiring a nuclear weapons capability, but no body new how he was going to acquire: whether through the plutonium reprocessing route or the uranium enrichment technique. He kept his secrets well guarded so that his planning was not jeopardized.

1.b. NUCLEAR REPROCESSING PLANT

In 1976, Pakistan signed an agreement with SGN of France to acquire a commercial scale plutonium reprocessing plant.[41] It was to be installed at Chashma in D. G. Khan district under international safeguards agreement signed by Pakistan, France and the IAEA.[42] The agreement was not only approved by the IAEA's Board of Governors, but also included the most stringent safeguard provisions in the history of nuclear technology transfer. Under the terms of the agree-

---

[39] Please see note 12 above.

[40] Herbert Krosney and Steve Weissman, *THE ISLAMIC BOMB* (New York, Time Books, 1981), pp. 44-46.

[41] Text of the Safeguards Agreement of 18 March 1976 Between France, Pakistan and the International Atomic Energy Agency, IAEA, INFCIR/239, 22 June 1976 (Washington DC, National Security Archives, 1989).

[42] ibid.

ment, government of Pakistan undertook that none of the equipment provided by France would be used to manufacture nuclear weapons or nuclear explosive devices, or for any other military purpose.[43] The agreement imposed additional obligations that none of the following materials or technology provided to Pakistan would be used for the manufacture of nuclear weapons or other nuclear devices or to further any other military purposes. It stated:

> Any other reprocessing facility or specified equipment for reprocessing which is designed, constructed or operated on the basis of or by the use of relevant technological information transferred from the French Republic;[44]
>
> Special fissionable or other nuclear material, including subsequent generations of special fissionable material, which has been produced, processed or used on the basis of or by the use of any item referred to in this article or any relevant technological information transferred from the French Republic;[45]
>
> Either the Government of the Islamic Republic of Pakistan or the Government of the French Republic, after consultation with the Government of the Islamic Republic of Pakistan, shall inform the Agency (IAEA) of any other reprocessing facility and specified equipment for reprocessing in Pakistan which is designed, constructed or operated on the basis of or by the use of relevant technological information transferred from the French Republic. Without limiting the generality of the preceding sentence, any reprocessing facility using solvent extraction or any specified equipment for reprocessing, designed, constructed or operated in the Islamic Republic of Pakistan within a period agreed upon between the Government of the French Republic and the Government of the Islamic Republic of Pakistan and to be communicated to the Agency, shall be deemed to be designed, constructed or operated on

[43] Text of the Agreement, Article 1.

[44] Text of the Agreement, Article 2(C).

[45] Text of the Agreement, Article 2(d).

> the basis of or by the use of relevant technological information transferred from the French Republic.[46]

The purpose of this lengthy quotation is to point out that under the terms of this agreement, not only the reprocessing plant supplied by France and any material processed in it would have been under the safeguards but any plant built by Pakistan on the basis of the French technology of "purex-solvent extraction" would have been placed under the similar safeguards.

France wanted to make it explicit through such additional safeguards that there would not be any diversion from peaceful uses of the plant and its technology towards military purposes. Despite such stringent provisions, the Franco-Pakistan agreement caused an uproar in the international press about the possible military employment of the plant. France and Pakistan both came under intense international pressure, particularly from the U.S. to abrogate the agreement. It was despite the fact that the U.S. had approved the agreement, being a member of the IAEA's Board of Governors and without casting a negative vote.

On 9 January 1978, French government announced that it had proposed a modification of the reprocessing plant in the form of a co-processing technique which would avoid the production of weapons-grade plutonium.[47] France took the plea that Pakistan would not require reprocessed plutonium for civilian uses before 15 to 20 years when she might install fast-breeder reactors.[48] Pakistan rejected the modified proposal and demanded implementation of the agreement 'as

---

[46] Text of the Agreement, Article 5 (C).

[47] THE PAKISTAN TIMES (Rawalpindi), 10 January 1978, p.1.

[48] ibid.

signed'.[49] It argued that it a heavy investment had already been made on the work site, including the import of materials from France, and the safeguards instituted in the agreement were stringent enough to ensure that there was no diversion for military purposes.[50] Ultimately, France cancelled the agreement in late 1978, reportedly on the basis of fresh evidence provided by the U.S. that Pakistan might misuse the plant to make nuclear weapons.[51] However, before France cancelled the agreement, the construction at Chashma was nearing completion and about 90 % of the plans had been delivered.[52] Pakistan's response to the objections against the reprocessing plant deal was not convincing. It stated that the plant was required because Pakistan hoped to become a centre for regional reprocessing in the future and not to make the bomb.[53] The PAEC's explanation was equally untenable that acquisition of the plant was essential for development of breeder technology in the future.[54] No ground work existed in Pakistan at that time for the breeder technology and do not exist even now.

The various elements of that controversy and the attendant complexities which blocked a mutually acceptable solution raised questions which have not been fully answered and merit a serious consideration. In the first place, it is

---

[49] THE PAKISTAN TIMES (Rawalpindi), 11 January 1978, p. 1.

[50] ibid.

[51] 'U.S. Says Evidence Shows Pakistan Planning the Bomb', WASHINGTON POST, 21 September 1980.

[52] Analysis of Six Issues About Nuclear Capabilities of India, Iraq, Libya and Pakistan, 17.

[53] THE SUN (Lahore), 15 May 1976, p.1.

[54] Munir A. Khan, NUCLEAR ENERGY IN PAKISTAN (Islamabad, Ministry of Information and Broadcasting, GOP, 1979), pp. 9-11.

important to know why the U.S. retrospectively stepped in with strong pressure on France and Pakistan to cancel the reprocessing agreement, while it had previously approved it as a member of the IAEA's Board of Governors. The U.S. AEC had also been involved in the negotiations along with the IAEA, France and Pakistan. As stated earlier, the apparent rationale offered was that the U.S. found fresh evidence after the deal that Pakistan intended to misuse the plant for military purposes.[55]

However, the evidence did not answer the question: how Pakistan would have misused a plant under trilateral safeguard measures, superimposed with additional French provisions? Pakistan had only one nuclear power generation plant, Karachi Nuclear Power Project (KANUPP), as a source of plutonium production which was under the IAEA-Canadian safeguards.[56] That meant Pakistan had to violate two separate international agreements pertaining to two different installations in order to misuse the facilities for making nuclear weapons through the reprocessing technique. This was considered as Mr. Bhutto's most preferred route for making nuclear weapons.[57] Spector believes that Bhutto followed both routes to produce nuclear weapons, though he initially relied on the plutonium reprocessing method until difficulties forced a shift to the uranium enrichment technique.[58] This view is supported by Ashok Kapur with reservation. He believes that Bhutto followed both routes to the bomb, but he preferred the

---

[55] See note 51 above.

[56] See appendix IX on Pakistan's nuclear reactors.

[57] Ashok Kapur, PAKISTAN'S NUCLEAR DEVELOPMENT (London. Croom Helm, 1987), p. 3.

[58] Spector, GOING NUCLEAR, pp. 101-105.

plutonium reprocessing method.[59]

The possibility of Pakistan violating two international agreements at the expense of its future relations with the West has not been carefully weighed by those who suspected it to acquire a bomb through the plutonium route. The option for Pakistan to construct an identical plant, say in 10 to 15 years, but refusing to put it under international safeguards would have been an equally serious violation of the Franco-Pakistan Agreement.[60] It suggests that if the Franco-Pakistan agreement had not been terminated, the possibility of a plutonium route to the bomb for Pakistan was non-existent. Pakistan's clandestine nuclear operations to acquire a uranium enrichment plant began earlier than the reprocessing controversy.[61] It indicates that Pakistan had no intention of misusing the reprocessing plant by violating the agreement with France.

The real issue at stake in that deal was not only the possibility of its misuse for military purposes, but the rigid postures of the U.S. and Bhutto governments. Despite intense pressure from the U.S., particularly during the visit of Henry Kissinger to Pakistan in August 1976, Bhutto refused to cancel or even accept modification of the reprocessing plant agreement.[62] On the other hand, he and his scientific advisers failed to provide a plausible explanation for Pakistan's acquisition of the plant. It had no justifiable

---

[59] Kapur, p.15.

[60] The period agreed upon between France and Pakistan under the terms of the agreement was 20 years. If Pakistan had constructed any reprocessing plant using French technology or a plant similar to that in 20 years, it had to be under the French-IAEA safeguards.

[61] See section 1, C below on uranium enrich plant.

[62] 'Kissinger Meets Pakistani Leader On Nuclear Issue', NEW YORK TIMES, 9 August 1976.

peaceful use of reprocessed plutonium in the immediate future. The U.S. position was equally rigid, given the comprehensiveness of the safeguards applicable to the plant. It is often quoted from Bhutto's *memoirs*, written in his death cell in 1979, that Pakistan was at the threshold of becoming a nuclear power before his government was overthrown.[63] The only thing needed was a reprocessing plant, he said. Bhutto's statement was misleading. By 1979, Pakistan had purchased most of the equipment necessary for establishment of Kahuta Uranium Enrichment Plant. He himself was the political architect of Kahuta plant, but wanted that to remain a secret until completion.[64] An apparent reason might be that disclosure about the plant at that stage would have jeopardized the culmination of the operations still underway. He also might not have liked to associate himself with the large-scale network of espionage and smuggling operations through which the plant was being acquired.

1.c. URANIUM ENRICHMENT PLANT AT KAHUTA

New evidence reveals another aspect of Bhutto's drive for the acquisition of a nuclear weapons capability which contradicts some of the prevailing fallacies about his development strategy, like the belief that he preferred a plutonium reprocessing route to produce nuclear weapons.[65] This

---

[63] Z.A. Bhutto, *IF I AM ASSASSINATED*, (New Delhi, Vikas, 1979), p. 118.

[64] Niazi, pp. 86-88.

[65] Niazi, pp. 77-90 and Zahid Malik, *DR. ABDUL QADEER KHAN AND ISLAMIC BOMB*, (Islamabad, Hurmat Publications, 1989). This publication is also in the Pakistani national language, *URDU* under the title *DR. ABDUL QADEER KHAN AUR ISLAMI BOMB*. Kausar Niazi was the only minister (Information and Broadcasting) whom Bhutto had taken into confidence about his nuclear pursuits in the period 1974-77. Zahid Malik is a retired Joint

evidence suggests that Bhutto used the issue of plutonium reprocessing plant as a gimmick to cover-up a wide network of clandestine operations which his government had secretly undertaken to acquire the uranium enrichment plant and other nuclear infrastructure.[66] He had instructed Kausar Niazi to launch a special publicity campaign to keep the Western attention focussed on the reprocessing issue while the enrichment plant's acquisition was in progress.[67] It was a calculated deception to keep attention diverted through orchestrated misinformation and at times deliberate, but costly provocation. After being confident about the success of the his plan, Bhutto was exalted to say: 'I WILL SEE THE HINDU BASTARDS NOW'.[68]

The U.S. pressure which resulted in cancellation of the reprocessing plant deal proved counterproductive in terms of the wider objective of Pakistan's acquisition of nuclear weapons technology. Since then, Pakistan is known to have constructed a small scale commercial reprocessing plant at PINSTECH, which is a scaled down version of the main incomplete plant at Chashma, and another pilot reprocessing plant at Sihala.[69] There is little doubt that Pakistan will eventually be able to commission the main plant, because most of the work was completed and nearly all the plans delivered

---

Secretary of the government of Pakistan and a very close friend of Dr. A.Q. Khan. His work is a biography of Dr. Khan.

[66] Niazi, pp. 84-88.

[67] ibid.

[68] Niazi, p. 84 and Malik. p. 95.

[69] 'Pakistan Building Secret Nuclear Plants', WASHINGTON POST, 23 September 1980.

before France cancelled the deal.[70] There does not seem to be any urgency to complete it because Pakistan does not possess safeguards-free plutonium by-product to reprocess. If France had not cancelled the deal, all these plants would be under international safeguards because of the obligations undertaken in the Franco-Pakistan agreement. But the agreement is not in force. On the other hand, Pakistan had paid a very heavy price in the field of peaceful nuclear technology, particularly nuclear power generation. It has not been able to install another nuclear power generation plant after KANUPP so far.

It also indicates that, given the intensity of a threat perception and motivation to seek a credible response to that threat, it is difficult to stop a country from pursuing a nuclear course in the absence of an alternative, like an extended nuclear guarantee. Pakistan undertook to acquire a nuclear weapons capability despite its limited industrial and technological base. The suspension of economic and military aid to Pakistan (including cancellation of agreements for the supply of sophisticated weapon systems like 100 F-7 aircraft) in 1977 by the Carter Administration to seek its compliance with the U.S. non-proliferation objectives did not compel it to stop or even slow its nuclear course. In the period between 1977 to 1979, momentum of Pakistan's nuclear development was at its peak. Most assessments of Pakistan's nuclear potential concluded that in view of the speed of its nuclear development in that period, Pakistan would have acquired nuclear weapons by 1981-1982.[71] On the contrary, it is equally relevant to note that with the augmentation of its conventional military capability through a limited force

---

[70] Analysis of Six Issues About Nuclear Capabilities of India, Iraq, Libya and Pakistan, p. 17.

[71] ibid. Some other U.S. Congressional estimates and independent studies have similar conclusions.

modernization programme with the U.S. assistance in the period 1980-88, (backdrop of the Afghan conflict), Pakistan demonstrated a willingness to slow down its nuclear drive, if not stop it altogether. The Pakistani case highlighted an other technological and financial aspect of the non-proliferation problem. There is a huge international nuclear black market which any potential proliferating state can successfully exploit if it has the requisite resources.

Pakistan eventually succeeded in operating a gas centrifuge uranium enrichment plant at Kahuta. The plant was established through a series of covert purchases of equipment and material from Western countries, which included: electrical inverters from Britain and Canada; stainless steel vessels from Italy; aluminum rods and vacuum pumps from West Germany; and vacuum valves, and evaporation and condensation systems from Switzerland.[72] It was the work of Bhutto regime. It is born out from Dr. Khan's observation that without Bhutto, there would have been no Kahuta.[73]

There are different and often conflicting estimates of the number of centrifuges operating at Kahuta and its output capacity. In June 1984, Senator Alan Cranston wrote that Pakistan had completed 1,000 centrifuges at Kahuta by 1983, which would give it a capability of producing 45 kg of enriched uranium per year.[74] In early 1986, FOREIGN REPORT stated Kahuta's capacity at 14,000 centrifuges, but worked out a relatively small annual output of 10 kg of enriched uranium per year.[75] In August 1986, a Pakistani source repor-

---

[72] FOREIGN REPORT, 18 June 1980, pp. 2-3.

[73] Malik, p. 24.

[74] Alan Cranston, 'Nuclear Proliferation and U.S. National Security Interests', CONGRESSIONAL RECORD, 21 June 1984, p. S7901.

[75] 'Inside Kahuta', FOREIGN REPORT 1 May 1986, p. 1.

ted that Kahuta was "rumoured to have 1,000 centrifuges, against a planned capacity of 2,000 - 3,000 centrifuges".[76] Yet another Pakistani publication has described Kahuta's centrifuge capacity at 10,000, capable of producing 150 kg of enriched uranium per year which is estimated to be enough for 6 to 7 nuclear weapons.[77] A similar assessment by David Hart concluded that Pakistan had enough centrifuges to produce enriched uranium for six weapons annually.[78] An Israeli letter distributed at the U.N. corroborates the above assessment of seven nuclear weapons per year, once all 10,000 centrifuges go into operation.[79] The disparity of estimates about Kahuta's output capacity is due to a lack of precise information about the exact centrifuges which operate at the Kahuta plant.

In an apparently more reliable assessment based upon U.S. government sources, David Albright estimates that Pakistan has installed between 1,000 to 14,000 centrifuges at Kahuta, but it has difficulty in operating more than 1,000.[80] According to Albright, Pakistan could produce 50 kg of weapons-grade uranium per year.[81] A Carnegie Report which relied on Albright's study, took 1,000 centrifuges as an 'acceptable assessment' of Kahuta's operational capacity and 21 to 63 kg of weapons-grade material as lower and higher

---

[76] THE MUSLIM (Islamabad), 09 August 1986.

[77] Malik, p. 121.

[78] David Hart, *NUCLEAR POWER IN INDIA* (London, George Allen & Unwin, 1982-4), P. 134.

[79] Israeli Letter distributed at the U.N. General Assembly. A/36/298, p. 3, cited by Kapur, p. 210.

[80] David Albright, 'Pakistan's bomb-making capacity', BULLETIN OF THE ATOMIC SCIENTISTS June 1987, pp. 30-31. (David Albright is a staff scientist at the Federation of American Scientists in Washington, D.C.).

[81] ibid.

estimates of its output capacity.[82]

Since the production of 45-50 kg of weapons-grade material per year is a common numerator in Senator Cranston's study, Albright's assessment, the Carnegie Report and the Pakistani source, its accuracy appears more reliable. According to Malik, the Plant was completed at a cost of 200 million dollars from 1976 to 1988.[83] It appears an under-estimation of the cost incurred on Kahuta plant in view of the highly expensive modern technology and widespread network of international operations involved in the process of its acquisition. There is no official denial or confirmation of these estimates from the government of Pakistan. It has maintained a complete secrecy about Kahuta's output capacity and the approximate date of its operation. Dr. Khan spoke about the imperative of secrecy in its formative phase: 'When towards the end of 1976, the foundation for the project was laid, it was decided that the project would be kept secret until such time when we had produced the necessary equipment for the project'.[84]

2. PAKISTAN'S NUCLEAR WEAPONS CAPABILITY: AN ASSESSMENT

There has been a controversy since 1980 about the timing of Pakistan's acquisition of a nuclear weapons capability. Dr. Khan confirmed for the first time in 1984 that Pakistan had mastered the process of uranium enrichment technology and the Kahuta plant was processing low-grade, non-

---

[82] NUCLEAR WEAPONS AND SOUTH ASIAN SECURITY: Report of the Carnegie Task Force on Non-Proliferation and South Asian Security (Washington D.C., Carnegie Endowment for International Peace, 1988), p. 16.

[83] Malik, p. 129.

[84] Dr. A.Q. Khan's interview with a Pakistani Weekly, *HURMAT*, 14 March 1985, pp. 1-5.

weapons uranium.[85] When asked how soon Pakistan was capable of producing nuclear weapons, he added that if in the interest of the country's solidarity, the President of Pakistan felt an extreme emergy and gave the team of scientists an important mission, it would not disappoint the nation.[86] In August 1984, FINANCIAL TIMES reported that Pakistan had succeeded in the indigenous development of precision engineering capability at Karachi where it could make stainless steel spheres for encasing uranium in an implosion type atomic bomb, and curved steel plates used to surround the conventional explosive which triggers the bomb.[87] Pakistan attempted to import these components in 1983 but was stopped by Western countries.[88] In March 1986, it was reported that Pakistan had achieved a capacity to enrich 30 % uranium at Kahuta.[89] In November 1986, WASHINGTON POST, citing classified U.S. intelligence reports, wrote that Pakistan had started producing weapons-grade uranium (over 90 %) at Kahuta Uranium Enrichment Plant.[90]

This was considered the most significant technological landmark which Pakistan had crossed in its quest for a nuclear weapons capability. After that time, General Zia's persistent rhetoric about the entirely peaceful nature of Pakistan's nuclear programme subsided. In March 1987, Zia

---

[85] 'Scientist Affirms Pakistan Capable of Uranium Enrichment, Weapons Production', NAWA-I-WAQT (Lahore), 10 February 1984, p. 1, and 'Pakistan's Nuclear Chief Say It Could Build The Bomb', WASHINGTON POST, 10 February 1984.

[86] ibid.

[87] Simon Henderson, 'Why Pakistan may not need to test a nuclear device', THE FINANCIAL TIMES, 14 August 1984.

[88] ibid.

[89] 'Pakistan Persists', FOREIGN REPORT, 27 March 1986, pp.1-2.

[90] Bob Woodward, 'Pakistan Reported Near Atom-Arms Production', WASHINGTON POST, 4 November 1986.

acknowledged for the first time that Pakistan had acquired a nuclear weapons capability. He stated, "Pakistan has the capability of building the bomb. You can write today that Pakistan can build a bomb whenever it wishes".[91] However, Zia hastened to add that Pakistan had no intention of making nuclear weapons.[92] The denial appeared diplomatic. It had been reported earlier that Pakistan was involved in R & D techniques since 1982 for manufacturing nuclear-weapons components; before it finally mastered the enrichment technology for weapon-grade material.[93] It had established a Weapons Design Directorate at its Wah Munitions Factory in 1980.[94] In July 1985, John Scali reported in ABC's 'Good Morning America' that Pakistan had successfully test-fired a non-nuclear triggering package.[95]

On 17 August 1985, FINANCIAL TIMES reported that Pakistan had unsuccessfully attempted to acquire Flash X-ray machines from the U.S. Hewlett-Packard company.[96] These machines are used to take split-second photos of very rapid processes through solid materials and to observe dummy nuclear cores as they undergo compression following the detonation of a triggering package.[97] The report admitted that the machines

---

[91] 'Knocking at the Nuclear Door', WEEKLY TIME MAGAZINE, 30 March 1987, pp.42-44.

[92] ibid.

[93] 'Zia's Road to Bomb', FOREIGN REPORT, 26 August 1982, pp. 1-2, and BBC's documentary PROJECT 706 "ISLAMIC BOMB".

[94] ibid.

[95] John Scali, 'Good Morning America', American Broadcasting Company, 11 July 1985; referred in NUCLEAR WEAPONS AND SOUTH ASIAN SECURITY, pp. 17-22.

[96] 'U.S. Halts High-Tech Camera Sale To Pakistan', FINANCIAL TIMES, 17 August 1985.

[97] ibid.

sought by Pakistan were too small to be used for nuclear purposes, and that Pakistan intended to calibrate conventional artillery pieces with the machines. However, the U.S. officials became concerned because the techniques for operating the small machines were the same as the larger flash X-Ray apparatus which Pakistan had acquired from Sweden in 1982.[98] In December 1985, Pakistan acquired a consignment of six flash X-Ray machines from the Swedish firm, Scandiflash, using fake company names to disguise the involvement.[99] It was further reported that Pakistan was exploring alternatives to flash X-Ray machines for verifying the effectiveness of nuclear weapons triggering package.[100] In late 1986, the WASHINGTON POST reported that Pakistan had achieved the capability to produce nuclear weapons in a matter of two weeks.[101]

Indian sources suspect that Pakistan's rapid nuclear development is a result of extensive nuclear co-operation between Pakistan and China. It is alleged that the later helped Pakistan with technical assistance in the installation of the uranium enrichment plant, a nuclear weapons design including nuclear test data and reprocessing technology.[102] It was also indicated that China might have made available to Pakistan a nuclear test-site, or be involved in a joint exercise for the detonation of its nuclear device.[103] To

---

[98] ibid.

[99] Christer Larsson and Jan Melin, 'Third World Countries Buy Swedish Nuclear Weapons Technology', *NY TEKNIK*, 2 May 1986, p. 1, translated in JPRS/NPD, 30 July 1986, p. 1.

[100] ibid.

[101] 'Pakistan Reported Near Atom-Arms Production', WASHINGTON POST, 4 November 1986.

[102] P.K. S. Namboodiri, 'Pakistan Links: Axis with China', *World Focus*, No. 55, July 1984, p. 17.

[103] IDSA Review, 18 (11), November 1985, p. 877.

further substantiate their claims, Indian sources generally allude to Bhutto's statement made during his trial under the Zia regime about his endeavour to promote Pakistan's nuclear capability before his government was overthrown. The statement was smuggled out of jail and published in his book from New Delhi in which Bhutto indicated about nuclear cooperation with China: 'In the present context, the agreement of mine, concluded in June 1976, will perhaps be my greatest achievement and contribution to the survival of our people and our nation'.[104]

Pakistan was thought to have made significant progress to acquire a nuclear weapons capability by 1988. This view was strengthened in early 1988 when U.S. President, Ronald Reagan determined under Section 670 (a) [1] of the Foreign Assistance Act that the material, equipment or technology being acquired by Pakistan was to be used in the manufacture of a nuclear explosive device.[105] However, he further determined that ending U.S. assistance to Pakistan "would be seriously prejudicial to the achievement of United States nonproliferation objectives and otherwise jeopardize the common defense and security".[106] He therefore, waived the prohibition of assistance required by the Act.[107] On 18th November 1988, he again certified to Congress that Pakistan did not possess a nuclear device, but added that his judge-

---

[104] Bhutto, *IF I AM ASSASSINATED*, p. 203. Bhutto was referring to a nuclear cooperation agreement signed between China and Pakistan in 1976.

[105] The U.S. Presidential Documents, Presidential Determination No. 88-5 of January 15, 1988, *FEDERAL REGISTER*, 53 (24), February 5, 1988, p. 3325.

[106] ibid.

[107] ibid.

ment was based upon a strict interpretation of the law.[108] It only meant that Pakistan did not possess a nuclear explosive device and not that it was not attempting to develop or has already developed the relevant capacities.[109] Later, he expressed concern that if Pakistan's nuclear capabilities continued to grow and evidence of its activities accumulated, a Presidential certification may be difficult or impossible to make with any degree of certainty.[110] He also emphasized his apprehension that the U.S. was extremely concerned by the continued risk of a nuclear arms race in the South Asian Subcontinent in view of the indications that India might also be stepping up its own nuclear weapons programme and delivery capabilities.[111]

According to FOREIGN REPORT, Pakistan's nuclear ambitions became "conclusive" towards the end of 1988 with the development of a "deliverable" bomb when Pakistani scientists perfected the bomb-design and the detonation mechanism.[112] A concern was expressed that China might arrange a nuclear test for Pakistan at Lop Nor.[113] The Report believed that the bomb was designed to be delivered from beneath the wing of an F-16 aircraft, and the possibility of flight training could not be entirely ruled out.[114] The Report is generally not that reliable. However, its validity about

---

[108] *FEDERAL REGISTER*, 6 December 1988, p. 49111 and 'Reagan Avoids Pakistan Nuclear-Weapons Issue', *Far Eastern Economic Review*, 5 January 1989.

[109] ibid.

[110] NEW YORK TIMES, 29 January 1989, p. 13.

[111] ibid.

[112] 'Pakistan's Atomic Bomb', FOREIGN REPORT, 12 January 1989), p. 1.

[113] ibid.

[114] ibid.

Pakistan was partially substantiated in 1989 when the Director of CIA, William Webster, informed the U.S. Congress that Pakistan was "engaged in developing a nuclear capability".[115] In October 1990, U.S. President, George Bush, refused to certify that Pakistan did not possess nuclear weapons and Congress cut off the economic and military aid for the financial year 1990-1991.[116] More recently, FINANCIAL TIMES has reported the possible illegal export of sensitive computer material with nuclear application to Pakistan by a Norwegian computer firm, Norsk Data, which had previously sold six NOR 5400 ND computers to it.[117] As Pakistan is known to have been producing weapons-grade material since late 1986, its total stockpile of such material could be around 250 kg, worth 10 to 15 nuclear weapons by late 1991.[118] Pakistan has about 37 to 38 F-16 aircraft capable of carrying nuclear weapons after requisite modifications. Pakistan has also two types of locally developed surface-to-surface missiles, *Haft-I* and *Haft-II* with a range of 80 km and 300 km respectively.[119] The guidance system for the missiles was designed and developed by Dr. Khan, the head of the Kahuta Uranium Enrichment plant.[120] There is no evidence as yet that the missiles have a nuclear capability.

---

[115] 'CIA Says Pakistan Is working To Gain Nuclear Capability', INTERNATIONAL HERALD TRIBUNE, 21 May 1989.

[116] 'Pakistan "Secretly enriching uranium", THE INDEPENDENT, 6 November 1990.

[117] 'U.K. inquiry renews fear on Pakistan N-Plans', FINANCIAL TIMES, 5 July 1991.

[118] See Appendices IX to X.

[119] 'Pakistan in missile build claim', Janes Defence Weekly, 18 February 1989.

[120] 'Pakistan develops missiles', Flight International, 15 April 1989.

3. PAKISTAN'S NUCLEAR POLICY UNDER Z.A. BHUTTO

From 1947 to 1958, Pakistani leaders, unlike their Indian counterparts, showed a remarkable lack of understanding about the potential role of nuclear energy in the industrial and scientific development of the country. Pakistan also lacked a scientist of Dr. Bhabha's calibre to develop plans for a nuclear energy programme. Unlike Dr. Bhabha, his Pakistani counterpart, Dr. Nazir Ahmad, never enjoyed a comparable access to government. The PAEC neither had the requisite administrative autonomy nor financial support to plan and execute the development of a nuclear power programme. Pakistan Army demonstrated a complete lack of interest in the nuclear programme despite the fact that it had a considerable say in the country's foreign and strategic policy since the early 1950s. It was neither interested in it as a technological capability nor a political option. Pakistani Foreign Office and the Ministry of Defence had the same attitude.

Pakistan's nuclear history actually begins with the takeover of General Ayub Khan's military government in 1958. Though the PAEC was established in 1955, it was revitalized as an effective statutory organization in 1965. While Ayub's government demonstrated an eagerness to promote the use of nuclear energy for civilian purposes, it was sharply divided on its role for military employment. Ayub himself and the Chairman of the PAEC, Dr. I.H. Usmani were committed to "peaceful use only".[121] Bhutto and his supporters favoured the development of a nuclear capability that had a potential for an eventual nuclear weapons option.[122] Bhutto recommended to develop a nuclear weapons capability without regard to its

---

[121] Zalmay Khalilzad, 'Pakistan', in Joseph Goldblat (ed.), NUCLEAR PROLIFERATION: THE WHY AND WHEREFORE (London, Taylor & Francis, 1985), p. 133.

[122] ibid.

economic viability. On the other hand, Dr. Usmani stressed the peace-bound objectives and economic viability of Pakistan's nuclear programme. Ayub seemed to accept Usmani's view by rejecting Bhutto's suggestion. If Ashok Kapur's opinion can be believed, Ayub's strategic thinking appears naive about the nature of nuclear weapons when he reportedly stated, "We will buy the bomb off the shelf if India goes nuclear".[123] However, Kapur's finding is questionable for two reasons: first, he offers no evidence in support of such a controversial remark and second, Ayub's public image of being an experienced General defies that impression. However, Ayub unequivocally rejected pressure from Bhutto and his group to develop a nuclear weapons capability.

The genesis of Pakistan's aspirations for a nuclear weapons capability date to the mid-1960s. Bhutto stated for the first time in 1965 that Pakistan would acquire a nuclear weapons capability because of the threat India's nuclear capability posed to the Pakistani security. He said, 'If India developed an atomic bomb, we will too develop one even if we have to eat grass or leaves or to remain hungry because there is no conventional alternative to the atomic bomb'.[124] Bhutto's statement was widely endorsed by cross-section of Pakistani elite, particularly the press which made frantic calls for making nuclear weapons in view of India's nuclear development.[125]

However, Bhutto's statement is generally misunderstood by overlooking its two aspects. First, the catch-phrase, 'to eat grass' to make the bomb is usually consider-

---

[123] Kapur, p. 26.

[124] Z.A. Bhutto, *AWAKENING THE PEOPLE*, p. 21. Also see Niazi, p. 77.

[125] 'We Must Make The Bomb', DAWN, 30 September 1965 and 'Pakistan Should Also Make A-Bomb', DAWN, 20 October 1965.

ed independently, or is detached from its original context of responding to India's quest for a nuclear weapons capability after the Chinese nuclear test in October 1964. Many Pakistanis like Bhutto were doubtful about the peaceful uses of nuclear explosives programme initiated by Shastri's government.[126] To presume that Bhutto being a foreign minister did not has any knowledge of the direction and depth of India's nuclear is not tenable. The evidence suggests the contrary. In his book published in 1969, Bhutto demonstrated his awareness of Indian nuclear intentions and believed that India would follow China and detonate a nuclear device.[127] He anticipated India going nuclear for reasons of power and security.[128] He spoke about the inadequacy of a conventional force posture and advocated the development of nuclear technology, not as a short-term military end but a long-term security objective.[129] After leaving Ayub's government in early 1967, Bhutto became more explicit about the Indian nuclear threat to Pakistan. He added, 'Pakistan's position is entirely different because, for us, the nuclear threat is real and immediate as India is reported to be on the threshold of becoming nuclear'.[130]

Second, it should not be ignored that the statement to eat grass to make the bomb was made in an emotionally charged environment immediately after the 1965 Indo-Pakistan conflict. Bhutto's statement was integral to the issue of Indian nuclear weapons capability and therefore, cannot be detached from its

---

[126] See Chapter Four, section 1 on Shastri's nuclear policy.

[127] Z.A. Bhutto, *THE MYTH OF INDEPENDENCE* (Karachi, Oxford University press, 1969), pp. 152-156.

[128] *ibid*, pp. 153-56.

[129] *ibid*.

[130] Bhutto, *AWAKENING THE PEOPLE*, p. 19.

original context.

It is relevant at this point to discuss Bhutto's personal traits, which were intrinsic components of Bhutto's personality and would help in understanding his nuclear policy. As a young foreign minister, he was known to be flamboyant, emotional and verbose person with a penchant for grandiose.[131] He had a natural proclivity for rhetoric, insinuation and use of metaphors in expression, like; 'We will fight for thousand years', and 'We will make nuclear weapons even if we have to eat grass.[132] On the other hand, it is noteworthy that after he left Ayub's cabinet, he promoted his political career through nuclear nationalism. It is not being suggested that Bhutto did not harbour ambitions to pursue a nuclear course. Bhutto was undoubtedly the sole architect of Pakistan's nuclear programme in the period 1965-1977. He had been chiefly responsible in setting up nuclear institutions like PINSTECH and Centre for Nuclear Studies.[133] Pakistan's only research reactor, Pakistan Research Reactor (PARR-1) and power reactor, KANUPP, were established under his supervision.[134] After assuming power on 20 December 1971, he convened a meeting of the Pakistani nuclear scientists on 20 January 1972 at Multan where he reportedly asked them to deliver him the so-called "Islamic Bomb".[135] This story contradicts the cautiously worded official statement which Bhutto personally made at the inaugural session of the meeting

[131] Oriana Fallaci, *INTERVIEW WITH HISTORY* (Boston, Houghton Mifflin Company, 1976), pp. 185,

[132] Z.A. Bhutto, *RESHAPING FOREIGN POLICY: 1958-19966* (Rawalpindi, Pakistan Publications, 1972-77), p. 224.

[133] PINSTECH 1965-1985, (Islamabad, Pakistan Institute of Science and Technology, 1985), pp. 3-5.

[134] Annual Report 1973-74, (Islamabad, PAEC, 1974), p. 13.

[135] Krosney and Weissman, pp. 44-46.

at Multan:

> Nuclear Energy is essential for the progress of mankind, for the progress of our people. We need nuclear energy, nuclear knowledge and nuclear research in Pakistan perhaps more than anywhere else.[136]

That meeting is usually cited to substantiate the argument that Bhutto's decision to go nuclear preceded the first Indian demonstration of a nuclear weapons capability in 1974.[137] This argument ignores that Mrs. Indira Gandhi also made-up her mind to detonate a nuclear device in the immediate aftermath of the 1971 Indo-Pakistan war.[138] It is probable that neither leader knew about the exact date of the other's decision. However, there were public reports in 1970 that India had decided to go ahead with the development of nuclear explosives and it was expected to detonate the first test within two years.[139] Dr. Vikram Sarabhai, Secretary of the DAE and Chairman of the Indian AEC, indicated that possibility in less than two years by saying, 'It is just a question of putting the bits together'.[140]

The 1974 nuclear test provided Bhutto an evident rationale to pursue a nuclear weapons capability and he became more vocal about the urgency to meet the Indian nuclear threat. He stated, 'Nobody will be able to stop us from pursuing this course of action now'.[141] Bhutto's government

---

[136] ATOMIC ENERGY IN PAKISTAN (Islamabad, PAEC, 1972) p. 2.

[137] Kapur, p. 137 & 141.

[138] See Chapter Four, Section 5.

[139] 'India to Give Atom Go-Ahead', SUNDAY TELEGRAPH, 26 July 1970.

[140] ibid.

[141] Malik, p. 84.

appeared certain that the Indian nuclear explosion was a weapon-test and professed to know the precise quantity of fissile material available to India for producing nuclear weapons. During a debate on a Pakistani resolution seeking assurances for non-nuclear weapon states (NNWS) at the Islamic Foreign Minister's Conference in Kuala Lumpur on 24 June 1974, Pakistani Minister of State for Defence and Foreign Affairs, Mr. Aziz Ahmad, told a closed session that India possessed material for 17 plutonium bombs and claimed that the estimate had been confirmed by Canada.[142]

Bhutto's statements were also self-contradictory. For example, on a visit to Tehran in 1976, he was asked whether Pakistan intended to produce a response to India's "Smiling Bhudha" (code name for the 1974 nuclear test)?[143] Bhutto retorted: 'Back home, we have the statue of a starving Bhudha'.[144] Another exposition of his contradictory nuclear policy is reflected in an interview in which he conceded that Pakistan had no military advantage in nuclear weapons but he would like to have the nuclear weapons technology, 'So that all options would be open to Pakistan, though we would not exercise the military option'.[145]

Pakistan never really recovered from its security dilemma after independence and it became worse after 1970-71. Pakistan suffered a humiliating defeat in 1971 and the morale of its armed forces was at a low ebb. The maintenance of a power equilibrium with India seemed out of question because of its larger economy, geography and demography. The

---

142 'India Can Make 17 A-Bombs', DAILY TELEGRAPH, 25 June 1974.

143 *Far Eastern Economic Review*, 30 July 1976, p. 37.

144 ibid.

145 DAWN (Karachi), 7 March 1977.

imbalance was exacerbated by India's strong industrial base, technological superiority and greater defence production capacity. Still worse was the U.S. arms embargo imposed during the 1970-71 war. Bhutto not only saw the development of a nuclear weapons capability as psychologically reassuring for the armed forces and the population at large, but also a diplomatic leverage against friends and foes alike. Additionally, he intended to use a potential nuclear weapons capability as a bargaining chip with the U.S. to have the arms embargo lifted. In an interview with Walter Schwarz, Bhutto stated:

> We must have a conventional deterrent. If not, then we'll say we can't do anything but explode some sort of nuclear device....We are not racing for the bomb. If we get even a modest contribution, we shall not find it necessary to proceed.[146]

Similarly in a statement reported by the PAKISTAN TIMES, he said, 'Ultimately, if our backs are to the wall and we have absolutely no option, in that event, this decision about going nuclear will have to be taken'.[147] On her return to Pakistan in April 1986, Benazir Bhutto admitted that the immediate objective of her father's nuclear programme was a trade-off for seeking conventional weapons.[148]

The U.S. initially considered Bhutto's nuclear policy as a melodramatic attempt to pressure Pakistan's Western allies into underwriting its security by lifting the arms embargo and provide modern arms.[149] Therefore, there was no immediate inclination to reward him. Ultimately, Bhutto

---

[146] THE OBSERVER, 1 December 1974.

[147] PAKISTAN TIMES (Rawalpindi), 27 December 1974, p. 1.

[148] 'We Want to Bring The Popular Rule', *India Today*, XI (9), 1 May 1986, p. 15.

[149] 'Pakistan bids for a nuclear niche', *The Christian Science Monitor*, 18 October 1974.

succeeded in getting the embargo lifted. An agreement was signed for acquiring A-7 fighter-bombers and phoenix missiles from the U.S.[150] However, by that time, he had already run into controversy about the nuclear reprocessing plant deal and the newly elected Carter Administration cancelled the arms agreement.

However, it is unrealistic to say that Bhutto's nuclear policy was 'ad hoc' and 'unplanned'.[151] It was not cost-effective from economic and commercial standpoint as he acted in a great hurry to acquire a nuclear weapons capability. Above all, he could not offer an acceptable justification for the use of reprocessed plutonium from the plant he sought. It is equally unrealistic and sweeping to say, "Bhutto's determination to go ahead with the nuclear reprocessing plant and the bomb may have cost him his life" because, as he claimed in his *memoirs*, Dr. Kissinger threatened to make a 'horrible examhple of him' if he did not abandon the reprocessing deal.[152] Such observations reflect a lack of understanding of the dynamics of domestic politics in Pakistan in the 1970s, particularly the rift between Pakistan Peoples Party's (PPP) leadership which was deposed from power and the military government. The underlying presumptions of such observations give the impression that General Zia and his associates killed Bhutto at the U.S. behest for making the bomb. This contradicts Zia's record in the field of Pakistan's nuclear development. Zia not only kept the development of a nuclear weapons capability intact, but increased the speed. He was nearly two years in government when in April 1979 the U.S. suspended all economic and military assistance to Pakistan for seeking a nuclear weapons capability. The available evidence

---

[150] ibid.

[151] Kapur, pp. 144-145.

[152] ibid, p. 145.

does not permit to establish a linkage between Zia's trial of Bhutto, his eventual execution, and the implied threat by Kissinger to Bhutto.

Bhutto's problem was his inflexible attitude and contradictory objectives. If he wanted to bargain a potential nuclear weapons capability for a conventional military capability, he failed to create an impression after the U.S. arms embargo was lifted, that he was willing to negotiate about the reprocessing plant or nuclear pursuits. In fact, he was full of contradictions, and of which he was not aware of. He had fallen out of favour in Washington because of his controversial economic policy of nationalization and socialism, but pressurized the U.S. for arms supplies. He also failed to develop a rapport with the Soviet leadership due to his opposition to the Tashkant Declaration.[153] During his visit to Moscow in 1972, he did not succeed in improving Pakistan-Soviet relations. He could do business with Mrs. Gandhi by signing the Simla Agreement, but she too regarded him as "unbalanced" and therefore, unreliable.[154]

It is also not a sound judgement that Pakistan sought the devolution of international power through the development of a nuclear weapons capability.[155] Pakistan's nuclear objectives during the Bhutto period were not to seek changes in the international power structure. Its primary motivation was to enhance its security vis-a-vis India. Bhutto wanted to compensate for Pakistan's conventional military weakness through the development of a nuclear weapons capability. A nuclear capability was considered, in addition to

---

[153] The declaration was signed at Tashkant in the Soviet union on 31 December 1965 by President Ayub and Prime Minister Shastri.

[154] Fallaci, p. 145.

[155] Kapur, p. 13.

its quest for a security equilibrium with India in the region, as an instrument for bargaining with the allies and adversaries. Generally speaking, he thought it a trump card in his foreign policy.[156] However, contrary to India, Pakistan did not challenge the international non-proliferation regime. But it did refuse to join, until India did the same.

4. PAKISTAN'S NUCLEAR POLICY UNDER GENERAL ZIA AND INDIA-PAKISTAN ACTION-REACTION NUCLEAR PARADIGM

Despite the fact that Bhutto's pursuit of a nuclear weapons capability became public in 1975-76, no apprehensions were expressed in India by the government, media, or the public. India's leadership did not take seriously the probable Pakistani response to its 1974 nuclear test. Dr. Homi Sethna, Chairman of the Indian AEC, contemptuously dismissed the possibility of a Pakistani nuclear response to the Indian nuclear test by saying that Pakistan neither had the technology nor the capable men to produce nuclear weapons.[157] Although there was an on-going diplomatic row between Pakistan and the U.S. about the former's nuclear intentions in relation to the Franco-Pakistan reprocessing plant, the possibility does exist that the precise information about the uranium capability acquired by Pakistan might not be fully known. A U.S. Congressional study suggested that there was a considerable underestimation of Pakistan's nuclear capability when it had virtually acquired most of the equipment for the Kahuta

---

[156] Suleiman Taseer, *BHUTTO: A POLITICAL BIOGRAPHY* (London, Ithaca, 1979), p. 154.

[157] Dr. Sethna's observation is cited in THE MUSLIM (Islamabad), 1st March 1987, in its report on DR. A.Q. Khan's controversial interview to an Indian journalist, Kuldip Nayyar. The interview was also published in THE OBSERVER, 1st March, 1987.

Enrichment plant. It stated, 'All in all, there is little solid public information to show that Pakistan now has the capacity to independently produce nuclear weapons material without foreign aid'.[158] Such assessments might have contributed to India's disregard of a Pakistani response. Overall India-Pakistan relations were also moving towards normalization under the framework of Simla Agreement.

In contrast to Bhutto, General Zia proved more adept in managing Pakistan's nuclear policy. He deliberately generated ambiguity, took calculated risks, and skillfully exploited the international environment. He took advantage of the loopholes in U.S. non-proliferation policy. During the first two years of his regime, Zia presided over the most rapid development of a nuclear weapons capability for which much groundwork was already laid by Bhutto. In 1978-79, the Carter Administration terminated economic and military assistance to Pakistan on the basis of the Symington Amendment to the Nuclear Non-Proliferation Act of 1978 (NNPA). The NNPA mandated termination of the U.S. aid to any country pursuing a nuclear weapons development, including the production of weapons-grade material, development of a nuclear device or a nuclear explosive capability.[159] In the assessment of U.S. officials, Pakistan's efforts to acquire a uranium enrichment plant were directed at achieving such a capability and they demanded full-scope safeguards if aid were to be renewed.[160]

---

[158] Analysis of Six Issues About Nuclear Capabilities of India, Iraq, Libya and Pakistan, p. 18.

[159] Testimony of Assistant Secretary of State, Thomas R. Pickering before the U.S. Senate Subcommittee on Energy, Nuclear Proliferation and Federal Services, Committee on Government Affairs, 1 May 1979; in, Hearing on Nuclear Proliferation: the Situation in India and Pakistan (Washington DC, U.S. Government Printing Office, 1979), p. 10.

[160] ibid.

Initially, Zia took exception to the criticism of Pakistan's nuclear pursuits and rejected the allegations of underlying military intentions. Speaking in Rawalpindi on 27 July 1979, he stated that international pressure had been directed against Pakistan despite assurances that the objectives of its nuclear programme were entirely peaceful.[161] He added that in view of the paucity of energy resources in Pakistan, there was no other option but to acquire nuclear technology.[162] He refused to accept full-scope safeguards and vowed to remain steadfast stating, 'We shall eat crumbs but will not allow our national interest to be compromised in any manner whatsoever'.[163] On 28 October 1979, TASS reported Zia's statement that he reserved the right to detonate a nuclear explosive device if it was considered essential for the further development of Pakistan's nuclear programme, which he insisted was peaceful.[164] This was an obvious departure from the previous policy, under which a PNE was considered to be indistinguishable from a weapon-test.

Zia reduced the intensity of his criticism of international objections about Pakistan's nuclear policy after the Soviet military intervention in Afghanistan in December 1979. By then, the prospects of renewal of the U.S. economic and military assistance to Pakistan had become obvious. But he was shrewd enough to reject an offer of 400 million dollars from an administration which remained in office only a few weeks more, dismissing it as "peanuts". In January 1981, he reiterated that Pakistan's entire nuclear programme was geared to

---

[161] THE PAKISTAN TIMES (Lahore), 28 July 1979, p. 1.

[162] ibid.

[163] ibid.

[164] WORLDWIDE REPORT: NUCLEAR DEVELOPMENT AND PROLIFERATION, No. 20, December 1979, p. 15.

fulfil the country's energy requirement.[165] He said that there was no justification to continually deprive it of nuclear technology for being a Muslim, developing and non-aligned state. While negotiating the economic and military aid package with the U.S., Zia deliberately fostered ambiguity and refrained from providing verifiable assurances that Pakistan would not produce nuclear weapons. Mr. James L. Buckley, the U.S. Under Secretary of State, testified to Congress that General Zia gave "absolute assurances" on one hand that Pakistan had no plans to develop nuclear weapons. But on the other, he refused to promise that Pakistan would not conduct a nuclear explosion if his scientists considered that necessary for the country's nuclear programme, which he insisted was "peaceful".[166]

Under General Zia's military regime Pakistan emerged as the most significant factor in the determination of the momentum of Indian nuclear weapons development. The renewal of military and economic assistance to Pakistan by the Reagan Administration, which invoked exemption to the Symington Amendment, caused much apprehension in India. Mrs. Gandhi, who returned back to power in 1980, suspected American connivance in Pakistan's quest for nuclear weapons capability, and often spoke against American support to Pakistan. In an interview in April 1982, she openly criticized the U.S. 'acceptance' of Pakistan's nuclear capability. She said,

> The knowledge we have gained purely from the Western sources, American and otherwise, is that they (Pakistan) are going in for a bomb. Now, America has accepted that situation, so far as we can make out.[167]

---

[165] MORNING NEWS (Karachi), 30 April 1981, p. 4.

[166] 'Pakistan Seen Nearly Capable of Atom Bomb', INTERNATIONAL HERALD TRIBUNE, 9 December 1981.

[167] Indira Gandhi, *PRIME MINISTER INDIRA GANDHI: STATEMENTS ON FOREIGN POLICY; APRIL SEPTEMBER 1982* (New Delhi, Ministry of Foreign Affairs, 1982), p. 9.

The traditional hostility and suspicion between the two neighbours surfaced again after limited improvement under the Simla Agreement. Now it spilled over to the nuclear field and added further complexities to the intricate dynamics of nuclear proliferation in South Asia. India-Pakistan nuclear policies became interlocked in an action-reaction syndrome, triggered by distorted perceptions and historical animosity. Any move by one motivated suspicion by the other, who responded by escalating its own nuclear development.

Given the history of Indo-Pakistan relations, India's apprehension of a Pakistani nuclear threat is understandable. Nothing could have been more disturbing for India than a Pakistani nuclear force. However, there was little that India could do to stop it. It could not mobilize international diplomatic pressure on Pakistan because of its own rejection of the NPT, full-scope safeguards, and other elements of the non-proliferation regime. It could only modify Pakistan's nuclear policy by demonstrating a willingness to accept corresponding limits on its own nuclear programme. But Mrs. Gandhi seemed to rule out that option.

In December 1982, a WASHINGTON POST correspondent, quoting U.S. intelligence sources, reported about Indian contingency plans to launch pre-emptive strikes against Pakistani nuclear installations, particularly Kahuta, as a last resort.[168] In response, Zia immediately signalled that such an attempt by India would be considered an act of war, against which Pakistan would retaliate with all the available means. Press accounts about the possibility of pre-emptive strikes against Kahuta by the Indian Air Force surfaced again

---

[168] Milton R. Benjamin, 'India Said to Eye-Raid Pakistani A-Plants', WASHINGTON POST, 20 December 1982.

in 1984 during a CIA briefing to the U.S. Senators.[169] According to this account, Indian military experts thought that the only way to stop Pakistan's nuclear weapons programme was to destroy its capability.[170]

Indian perceptions of a Pakistani nuclear threat increased in June 1984 when press reports based on U.S. intelligence sources revealed Chinese assistance to Pakistan in mastering the uranium enrichment process.[171] As noted earlier, it was reported that China also provided Pakistan the weapon design of its 4th nuclear test carried out in 1966.[172] China and Pakistan denied the reports. According to Senator Alan Cranston, Reagan Administration officials believed that Pakistan was engaged in designing nuclear weapons and the acquisition of related technological infrastructure.[173] However, the Administration refused to support proposed legislation to cut off aid to Pakistan. A cut off was considered detrimental to U.S. security interests because of the Afghanistan conflict.[174] Unhappy over the Administration decision, Congress enacted the Pressler amendment to the Foreign Assistance Act, which instituted an annual certification by the President that "Pakistan does not possess a

---

[169] *NUCLEONICS WEEK*, 25 (38), 20 September 1984, p. 4.

[170] ibid.

[171] Leslie H. Gelb, 'Pakistan Links Peril U.S.-China Pact', NEW YORK TIMES, 22 June 1984.

[172] Leslie Gelb, 'Peking Said To Balk At Atomic Pledges', NEW YORK TIMES, 23 June 1984.

[173] Senator Alan Cranston, 'Nuclear Proliferation and U.S. National Security', *CONGRESSIONAL RECORD*, June 21, 1984, p. S7901.

[174] United States Security Interests in South Asia: A Staff Report, the U.S. Senate Committee on Foreign Relations, (Washington DC, U.S. Government Printing Office, 1984).

nuclear explosive device" for the aid-package to continue.[175]

Mrs. Gandhi described the Pakistani nuclear threat as a "qualitatively new phenomenon in our security environment".[176] Under the spectre of a Pakistani nuclear threat, she accelerated the enlargement of India's nuclear weapons capability until her death in October 1984.[177] India speeded up work for the reprocessing of safeguards-free plutonium from MAPS I & II reactors at the Trombay Reprocessing Plant which was refurbished to increase its output capacity from 30 to 100 metric tons per year.[178] Reprocessing of plutonium also started at the Tarapur reprocessing Plant (PREFRE).[179]

Pakistan also speeded up the development of its nuclear weapons capability to cope with the Indian nuclear threat. According to Dr. Spector's assessment, based upon interviews with the official U.S. sources, there was a growing support for "all components available characterization" of Pakistan's nuclear programme in mid-1986.[180] These reports put India under considerable pressure not to let Pakistan take a lead in the nuclear field. In late 1986, he further reported about Pakistan's acquisition of "the essentials of a rudimentary nuclear deterrent of perhaps three to six nuclear devices" which was considered to have caused a change of

---

[175] The U.S. Foreign Assistance Act 1961 Section 620E(e), 1985.

[176] INDIAN EXPRESS, 15 October 1984.

[177] Nuclear India: Department of Atomic Energy, Government of India, 24 (5 & 6), Bombay, 1986. For details, see next chapter (Six), section 2 on Mrs. Gandhi's nuclear policy.

[178] 'India's Supply of Unsafeguarded PU Grows As Reprocessing of MAPS Fuel Begins', NUCLEAR FUEL, 11 August 1986, p. 3.

[179] ibid.

[180] Spector, *GOING NUCLEAR*, p. 101.

"historic proportions" in the Indian security process.[181] At that time, India commissioned its long-term project (R-5), renamed DHRUVA, one of the world's largest Safeguard-free research reactor with a plutonium production capacity of 25 kg per year.[182] It gave a significant boost to its capacity to produce safeguards-free plutonium at a larger rate. Indian nuclear capability received a stimulus from DR. Khan's interview in THE OBSERVER about Pakistan's nuclear weapons capability when he stated, "America Knows it. What the CIA has been saying about our possessing the bomb is correct and so is the speculation of some foreign newspapers".[183] General Zia's interview in March 1987 with the WEEKLY TIME MAGAZINE was equally serious from the Indian point of view, though his style was less provocative than of Dr. Khan.[184]

India perceived an official hand behind the interviews. It believed that Pakistan sought to publicize its nuclear weapons capability during an unprecedented and large Indian military exercise, BRASS TACK, which occurred in winter 1986-87 on Pakistan's Southern border along the troubled province of Sind.[185] India felt under pressure to neutralize the impact of Pakistan's projection of its nuclear capability. An opinion poll published by INDIA TODAY after Dr. Khan's interview showed that 69 % of those interviewed believed that

---

[181] Spector, *THE UNDECLARED BOMB*, p. 88.

[182] RESEARCH REACTORS AT TROMBAY (Bombay, Bhabha Atomic Research Centre, GOI, 1987), pp. 1-2.

[183] Kuldip Nayyar, 'We Have the Bomb, Says Pakistan's Dr. Strangelove', THE OBSERVER, London, 1 March 1987. The same story was also carried by a Pakistani Daily, THE MUSLIM (Islamabad), 1 March 1987. The Editor of The Muslim, Mr. Mushahid Hussain, who was primarily instrumental in arranging the interview, was also present.

[184] 'Knocking At The Nuclear Door', pp. 42-44

[185] *India Today*, 31 March 1987. (cover story).

Pakistan possessed nuclear weapons and therefore, India must also acquire nuclear weapons.[186] It is quite possible that the Pakistani military, or at least Generals, Zia and Arif, might have deliberately sought to generate ambiguity to compensate for Pakistan's military inferiority in the midst of that exercise.[187] The timing of both the interviews may not have been a coincidence with the climax of the confrontation between the armed forces of the two countries.[188]

There were simultaneous reports of Pakistan improving its weapons design. According to a source, Pakistani scientists developed a detonation mechanism and bomb casing that can withstand the buffeting of high-speed flight.[189] Progress was reported on the development of a fusing mechanism which keeps the bomb safe while in storage and flight, but causes proper detonation after released from the aircraft.[190] Pakistan was also known to have pursued the implosion technique instead of explosion, as the former is considered more suitable for producing nuclear weapons.[191] However, there is no fundamental difference between the two.

Zia proved a shrewd bargainer, an introvert and deliberately ambiguous. He demonstrated a high degree of brinkmanship in his handling of the Afghan conflict. He

---

[186] ibid.

[187] This was the impression I elicited during an interview with Mr. Kuldip Nayyar in New Delhi on 16 July 1988. Mr. Nayyar was the journalist who interviewed DR. Khan. He was later on appointed India's High Commissioner in Britain during Mr. V.P. Singh's government. General K. M. Arif was Vice-Chief of Army Staff, directly under Zia in that period.

[188] For Indian response to Pakistan's nuclear development at this stage, see next chapter (Six), section 3.

[189] 'Pakistan's Atomic Bomb', p. 1.

[190] ibid.

[191] ibid.

deflected occasional threats from the Soviet Union on one hand and India on the other, with a skillful employment of U.S. support. He successfully orchestrated a limited but proportional restraint in developing nuclear weapons in exchange for continued U.S. military and economic aid. He was incongruous about the stated objectives of Pakistan's nuclear programme. He took a line similar to India's posture that a PNE and a weapon test were not distinguishable. He often stated that any nuclear programme whether peaceful or otherwise was convertible into a non-peaceful one.[192] Like Indian leaders, he also sought refuge in ambiguity to avoid provocation.

Despite India and Pakistan adopting ambiguous nuclear postures, the nuclear capabilities of both states appeared so advanced that an elementary form of implicit nuclear deterrence was virtually operative by 1987-88. Talking to the participants of an International Conference on Regional Security and Stability in South Asia, jointly organized by the International Institute for Strategic Studies, London, and Quaid-i-Azam University, Islamabad-Pakistan, Zia claimed the existence of an undeclared state of nuclear deterrence between India and Pakistan.[193] He gave a similar impression to a delegation of the visiting U.S. officials before that conference.[194] Later on, in an interview with a member of the delegation (conference), Mr. Selig Harrison, he stated:

---

[192] Defence Journal (Karachi), VIII (4), 1982, pp. 8-9.

[193] I was personally present on the occasion as member of the IISS delegation when President Zia made the statement. For a detailed account, see, Report of the Visit to India and Pakistan by a Delegation of the Carnegie Task Force on Non-Proliferation and South Asian Security, June-July 1988 (Washington DC, Carnegie Endowment for International Peace, 1988), pp. 7-10.

[194] Report of the Visit to India and Pakistan by the Delegation of the Carnegie Task Force on Non-Proliferation and south Asian Security, p. 8.

> With respect to their [India's] nuclear capabilities, if they create ambiguity, that ambiguity is the essence of deterrence. The present programs of India and Pakistan have a lot of ambiguities, and therefore, in the eyes of each other, they have reached a particular level, and that level is good enough to create an impression of deterrence.[195]

Even without such an explicit statement, the existence of an elementary form of implicit nuclear deterrence between India and Pakistan appears to be operative on the basis their nuclear programmes, the level of capabilities developed, and their mutual perception that each could deploy nuclear weapons in any future conflict. The Indian response to Zia's posturing was less explicit. Without clearly stating that India possessed nuclear weapons or unassembled components, Indian government seemed prepared as a matter of contingency to counter the nuclear threat from Pakistan by alluding to the advancement and sophistication of its nuclear weapons capability.[196] Simultaneously, India continued to advance its nuclear weapons capability without publicity. Indian nuclear policy continued to highlight the "reconsideration" of the previous policy of not making nuclear weapons, but still denied that it had produced nuclear weapons. The Indian response appeared carefully articulated to avoid provocation not only to Pakistan, but also the great powers. Indian policy was vague and ambiguous enough to convey different meanings to different parties so that India's national interests were not jeopardized either by overstating or under-estimation of its nuclear weapons capability. However, its nuclear technological development remained ahead of Pakistan.

---

[195] Ibid.

[196] See statements of the late P.M. Rajiv Gandhi, his Defence Minister K.C. Pant and Minister for External Affairs, N.D. Tiwari in Chapter Six, section 3.

5. PAKISTAN'S NUCLEAR POLICY IN THE POST-ZIA PERIOD

On her return to Pakistan from political exile in April 1986, Miss Benazir Bhutto stated that the Zia regime was pursuing a nuclear weapons programme that jeopardized Pakistan's relations with the U.S., for which the country was paying a heavy price.[197] She therefore, demanded that the policy be reconsidered. Soon afterwards, in an interview with the INDIAN EXPRESS, she stated,

> We only want nuclear energy for peaceful purposes and we are prepared to set all doubts at rest on this score because it has undermined our relations with other countries and has complicated matters for Pakistan.[198]

Her assurance was interpreted in various circles as a willingness to permit inspection of Pakistan's nuclear facilities if she came to power. She reiterated her opposition to a Pakistani bomb, but not a willingness to sign the NPT.[199] She apparently pointed out to the U.S. officials that if the CIA could detect Pakistani efforts to "enrich uranium and acquire bomb components", it would be able to verify her pledge not to acquire nuclear weapons.[200] She became Prime Minister in December 1988 as a result of elections held after Zia's death in an air-crash.

However, the crucial question was not Benazir Bhutto's willingness to stop pursuing a weapons course, but

---

[197] 'Benazir for Recognizing Karmal and Abandoning Nuclear Research', THE PAKISTAN TIMES OVERSEES WEEKLY, 20 April, 1986.

[198] 'Indian Express Interviews Benazir Bhutto', INDIAN EXPRESS, 30 July 1986, reprinted in Foreign Broadcast Information Service / South Asia, 14 August, 1986, p. F2.

[199] Nuclear Proliferation in South Asia: Containing the Threat; A Staff Report to the Committee on Foreign Relations, United States Senate (Washington DC, USGPO, 1988), p. 17.

[200] ibid.

her ability to influence the nuclear decision-making process in Islamabad. She headed a minority government and faced a serious challenge to her authority from two opposition-run provincial governments. Her executive powers as Prime Minister had been significantly restricted because of the 8th amendment in the Constitution which the Parliament enacted in 1985 under Zia's military government. She did not enjoy a majority in the new Parliament to undo the 8th amendment. Additionally, she did not seem to control the reportedly secret 'Nuclear Weapons Programme Coordinating Committee' which was still chaired by President Ghulam Ishaq khan.[201] Reportedly, the other members of that committee were: Dr. Abdul Qadeer Khan who is the Head of Kahuta plant and Munir Ahmad Khan, the former Chairman of the PAEC, whose Directorate of Technical Development carried out the essential R & D for the militarization of the country's nuclear weapons capability.[202] Ishaq Khan had made a great contribution to the development of Pakistan's nuclear weapons programme before he became the President. Under the present constitutional order, President is the Supreme Commander of Pakistan Armed Forces and bears responsibility for national security. He seems to have full control over Pakistan's nuclear programme. Benazir Bhutto was reported to have admitted that she did not know whether Pakistan had nuclear weapons because she had not been fully acquainted with the state secrets.[203] She was apparently cooperative with the Army Generals, but known to have privately advocated restraint on the nuclear issue.[204] According to Spector, there is evidence that Benazir Bhutto had slowed down

---

[201] 'Pakistan's Atomic Bomb', p. 2.

[202] ibid.

[203] 'Bhutto in Dark', THE INDEPENDENT, 3 January 1989.

[204] THE INDEPENDENT, 7 August, 1990.

'certain narrow aspects' of Pakistan's nuclear programme in 1989 when the U.S. President issued the certificate that it did not "possess a nuclear device".[205]

Benazir Bhutto was sacked as Prime Minister on 6 August 1990 because of corruption charges by President Ghulam Ishaq Khan under the constitutional authority drawn from the 8th amendment. Given that the wide-spread corruption in Pakistan is not a product of Bhutto's short-lived government alone, not many people were convinced about the validity of the corruption charges. The possibility of a co-relationship between her moderate nuclear stance and the dismissal of her government cannot be dismissed altogether. Soon after her dismissal, Pakistan's advances in nuclear weapons technology led to the suspension of U.S. aid for the financial year 1990-91 when President George Bush refused to issue a certificate to Congress that Pakistan did not possess a nuclear explosive device.[206]

The new Prime Minister of Pakistan, Mr. Nawaz Sharif, is an enterprising businessman and skillful power broker, but known to be a protêgé of the army. He is known to have been groomed by the Inter-Services Intelligence agency under the Zia regime. In his first address to the National Assembly on 7 November 1990, (where his party along with the Islamic Democratic alliance [Islami Jamjoori Itehad], commands a two-thirds majority), he echoed the establishment view on nuclear policy.[207] During the elections, he attacked Benazir Bhutto's nuclear policy as "pliable" under U.S. pressure. However, it is not clear whether his attacks were meant for political expediency alone or he is personally committed to acquiring nuclear weapons. He faces increasing pressure from

---

[205] Spector with Smith, p. 89.

[206] See note 116 above.

[207] DAWN (Karachi), 8 November 1990.

his alliance partners in the National Assembly, on whom his government depends along with Army support, not to compromise on the nuclear weapons programme. President khan also emphasized in a keynote address to the joint session of the newly elected Parliament on 8 November 1990 that Pakistan would not compromise its nuclear policy as a *quid pro quo* for renewal of U.S. aid.[208]

However, P.M. Sharif appears keen to restore the aid linkage with the U.S. because Pakistan faces an acute economic crisis due to suspension of aid and financial implications of the Gulf war. Nevertheless, he is facing an acute dilemma. To his disadvantage, the U.S. policy-makers are so far determined to demand that Pakistan satisfy the requirements which led to the suspension of aid. Pakistan Army is in dire need of U.S. military equipment and the requisite financial credits to buy various weapon systems. He might attempt to convince the nuclear hawks in the Pakistani establishment to arrive at some settlement with the U.S. on the nuclear issue in view of the pressing financial and security crisis. However, the task is not easier because the President and the military are deeply committed to the development of a nuclear weapons capability so long as India does not concede to accept reciprocal limitations. He has already initiated a proposal for a five nation conference on nuclear weapons in South Asia to be held as soon as possible in which the United States, the Soviet Union, China, India and Pakistan participate to resolve the issue.[209] However, India immediately rejected the Pakistani proposal, calling it

[208] DAWN (Karachi), 9 November 1990.

[209] 'Pakistan Seeks Talks On Nuclear Curbs', INTERNATIONAL HERALD TRIBUNE, 7 June 1991.

a propaganda ploy in which there is 'nothing new'.[210]

Pakistan's nuclear development in the 1980s had a strong influence on the Indian nuclear decision-making process and its weapons capability. It engendered a threat perception which caused a sense of urgency in India to accelerate its nuclear weapons development. The top Indian leadership has occasionally indicated a possible "reconsideration" of their policy of not making nuclear weapons. Even at face value, it means that Indian nuclear policy would shift from a peaceful to military orientation. Actually, the available evidence suggests that India has moved much ahead in the development of its nuclear weapons capability [211] Public pressure has gradually grown in India for the development of nuclear weapons to preempt the dangers originating from Pakistan's nuclear weapons programme. Indian governments are not only sensitive to public pressure, but also vulnerable. In brief, Indo-Pakistan nuclear competition has defied a mutually acceptable solution. It is imperative that Pakistan remains below the threshold and does not produce nuclear weapons to avoid providing a rationale for India for a full-fledged and overt nuclear weapons response which would unleash an open ended nuclear arms race in the Subcontinent.

---

[210] 'Pakistan's atom plan rejected', THE INDEPENDENT, 08 June 1991.

[211] See the policy changes in the next chapter and an assessment of Indian nuclear weapons capability in chapter Seven.

Chapter Six

INDIAN NUCLEAR STRATEGY 1977 TO 1991
EXPANDING THE WEAPONS CAPABILITY

India's nuclear weapons capability gradually expanded from 1977 to 1991, except for a brief period of technological inaction during the first Janata government under Mr. Morarji Desai. It pursued the objective of advancing the weapons capability within the framework of its civilian nuclear programme. Pakistan's pursuit of a nuclear weapons capability appeared an obvious rationale for that objective, but the growing sophistication and advancement of the Chinese nuclear capability also contributed. India kept on questioning the legitimacy of the non-proliferation regime and the right of great-powers to manufacture nuclear weapons while denying it to the non-nuclear weapon states (NNWS). It rejected all the proposals for a regional solution to the issue of South Asia's nuclearization offered by Pakistan. The domestic nuclear debate in the 1980s generated further pressure on successive Indian governments to accelerate the development of a nuclear weapons capability from the standpoint of security, power and prestige. A relatively rapid expansion took place under the governments of Mrs. Indira Gandhi (1980-1984) and her son, Rajiv Gandhi (1984-1989). A brief period of political instability followed from 1989 to June 1991 when India had two more Janata governments. However, in contrast to 1977-1980, the governments of Prime Ministers V.P. Singh and Chandra Shekar continued R & D in the field of nuclear weapons technology, though in a more subtle way than Mrs. Gandhi and Rajiv Gandhi. A lot of evidence about India's involvement in the acquisition of various elements of a nuclear weapons capability became public during this period. India would continue to pursue a nuclear weapons course after the installation of Congress Party's government in June 1991 under Mr. Narsima Rao because of its consistent nuclear policy in this regard.

1. INDIAN NUCLEAR POLICY UNDER THE FIRST JANATA GOVERNMENT: (1977-1980)

The government of Mr. Morarji Desai in 1977 suspended work on the further development of "peaceful" nuclear explosions (PNE) programme initiated by Mrs. Gandhi, and reportedly disbanded the team that carried out the 1974 nuclear test.[1] Mr. Desai stated that Indian scientists had failed to convince him that a PNE would serve any economic or peaceful technological objectives.[2] That is too obvious contradiction of Mrs. Gandhi's repeated rhetoric on the utility of PNEs, including the 1974 test, for non-military purposes. However, before analyzing Indian nuclear policy under Desai's government, it needs to be born in mind that Mrs. Gandhi had not planned more PNEs immediately after the first test. By suspending the work on the PNEs and disbanding the team, Desai demonstrated that he would not pursue the development of nuclear weapons. Some specialists believe that the restraint exercised by Desai's government was not only inspired by his own initiative, but was also the result of pressure from the United States.[3]

---

[1] 'Shadow of an Indian H-Bomb', *Foreign Report*, 13 December 1984. pp. 1-2.

[2] Rodney W. Jones, 'Dilemma Without Anguish: India, Morarji and the Bomb', in T.T. Pouloose, *PERSPECTIVES ON INDIA NUCLEAR POLICY* (New Delhi, Young Publishers, 1978). The point was clarified with Rodney Jones during a discussion with in Washington DC on 19 April 1989 in which he confirmed Desai's statement. He was a consultant in the State Department at the time of discussion.

[3] See for example, Paul F. Power, 'The Indo-American Nuclear Controversy', *Asian Survey* 19, (6), June 1979, pp. 582-583.

Nonetheless, there is no evidence that Desai's government was ever willing to surrender what had already been achieved by carrying out the 1974 test. During a visit by the U.S. President Jimmy Carter to India (1-3 January 1978), Desai rejected the U.S. demand for signing the NPT unless all five nuclear weapon states signed a comprehensive test ban treaty.[4] He also refused to accept application of full-scope safeguards on the Indian nuclear programme.[5] He only promised a restraint, not to develop nuclear weapons. President Carter was surprised by Desai's point blank refusal on the issues of NPT and the safeguards because he had been led to believe that the Indian government would be willing to discuss its adherence to the NPT, and might be amenable on the issue of full-scope safeguards.[6] It appears that by misjudging Desai's conditional softness on full-scope safeguards, President Carter pushed too hard too soon, and so provoked an early refusal.

Desai's general call to renounce nuclear weapons was opposed by his own allies in the Janata Government.[7] The Minister for External Affairs, Mr. Atal Behari Vajpayee, who had been a vocal bomb lobbyist as a political leader in the Jan Sangh Party, exercised considerable influence on Desai against signing the NPT and accepting full-scope safeguards.[8] Before becoming Prime Minister, Desai was a well known opponent of the development of nuclear weapons but favoured the retention of a nuclear option until and unless the nuclear weapon states (NWS) accept corresponding limits on their

---

[4] THE GUARDIAN, 15 January 1978.

[5] ibid.

[6] ibid.

[7] NEW YORK TIMES, 3 June 1981.

[8] ibid.

nuclear programmes.[9] There is no evidence of a change in his nuclear thinking after he became the Prime Minister. The text of Delhi Declaration signed by President Carter and Prime Minister Desai in January 1978 reflects an equal emphasis on horizontal and vertical nuclear proliferation. It reads: 'Existing stockpiles of nuclear weapons must be reduced and eventually eliminated, and the danger of proliferation of nuclear weapons must be arrested'.[10]

In fact, Desai attempted to bargain with the U.S. on the issue of nuclear fuel for the Tarapur atomic reactors by pledging to refrain from producing nuclear weapons but not on the question of India signing the NPT. He clearly stated that if the U.S. did not send the shipment of enriched uranium for the Tarapur reactors, "then all ways are open to us, even the processing of used fuel will be open to us".[11] He also indicated that India might unilaterally refuse to provide rhesus monkeys to the U.S. under a 23 year old agreement, alleging that contrary to the agreement, the U.S. used the monkeys for R & D in the military field.[12]

Subsequently, it was reported that Desai did agree conditionally to accept full-scope safeguards in his meeting with the British Prime Minister James Callaghan.[13] The Desai-

---

[9] M.J. Desai, 'India and Nuclear Weapons', *Disarmament and Arms Control*, 3,(2), Autumn 1965.

[10] Text of The Delhi Declaration Signed By The U.S. President Jimmy Carter And India's Prime Minister Morarji Desai, dated 3 January 1978 (Washington DC, National Security Archives, 1989).

[11] Text of The Statement of Honorable Richard L. Ottinger Before The Committee on International Relations, House of Representatives, dated 23 May 1978, 95th Congress, 2nd Session, p. 5 (Washington DC, National Security Archives, 1989).

[12] ibid.

[13] THE GUARDIAN, 15 January 1978.

Callaghan understanding appeared as a compromise formula under which India would accept the full-scope safeguards provided it would not be pushed to sign the NPT and at least three nuclear weapon states; the U.S., the U.S.S.R., and the U.K. signed a comprehensive test ban treaty.[14] India's relaxation of its condition for China to adhere to the prospective agreement appeared as a concession given by Desai's government. The matter was followed up during the visit of the U.S. Deputy Under Secretary of State, Mr. Joseph Nye, in November 1978. India accepted 'in principle' a proposal for establishing a 'Committee of scientists' to look into the question of what safeguard options were available to the non-signatories of the NPT and its impact on their indigenous nuclear programmes.[15] It was also agreed to explore whether an arrangement could be worked out which would meet the requirement of putting all the nuclear facilities of non-nuclear weapon states under safeguards without interfering with their civilian nuclear development programmes.[16] The proposal eventually failed in 1979 because the differences on fundamental issues could not be resolved, including the membership of the Committee.

The general misunderstanding about the Desai government's nuclear policy by the U.S. policy-makers is aptly described by an American specialist:

> U.S. leaders in the late 1970s gambled too heavily on unrealistic hopes (that the Indian leaders would accept full-scope safeguards out of the goodness of their hearts and that Pakistani leaders would accept economic arguments as sufficient reason to dispense with the reprocessing or enrichment), mistakenly saw progress in equivocation (such as believing that

---

[14] ibid.

[15] N. Ram, 'India's Nuclear Policy: A Case Study in the Flaws and Futility of Non-Proliferation', a paper prepared for the 34th Meeting of the Association of Asian Studies, Chicago, 2-4 April, p. 13, and note 51.

[16] ibid.

> Prime Minister Morarji Desai's conditional statements against peaceful nuclear explosions were a promise), and found themselves hobbled by the inflexibility of U.S.laws (principally, the Nuclear Non-Proliferation Act of 1978).[17]

The controversy in the Indo-U.S. nuclear relations became more complex with the enactment of the Nuclear Non-Proliferation Act (NNPA) of 1978 by the United States, for which India had provided the stimulus by its 1974 nuclear test. The NNPA provided that after a 2 years grace period from 1978, any recipient of U.S. nuclear exports must have all of its nuclear facilities under full-scope international safeguards as a condition for continued supply.[18] The NNPA provision runs contrary to the Indian nuclear safeguards doctrine; that India will accept full-scope safeguards on its nuclear facilities only if all other states, including the nuclear weapon states, do the same.

Desai's successor, Prime Minister Charan Singh, lost no time in reversing Desai's nuclear policy and made a public statement that India would neither sign the NPT nor accept the full-scope safeguards.[19] He reiterated the traditional Indian nuclear policy pursued by Nehru and followed by Shastri and Mrs. Gandhi. His reversion to India's previous policy also owes a great deal to domestic pressure because Desai's nuclear policy was generally assailed by the Indian press, media and also within the Parliament as a sell-out or a "Nuclear Munich". However, his government proved too short-lived to make further practical contribution to Indian nuclear policy.

---

[17] Richard K. Betts, 'U.S. Policy Choices: India, Pakistan and Iran', Yaeger (ed.), <u>NON-PROLIFERATION AND U.S. FOREIGN POLICY</u> (New York, Brooking Institution, 1981), pp. 323-324.

[18] Text of the Nuclear Non-Proliferation Act (NNPA) of 1978.

[19] Betts, p. 331.

Desai's government did not perceive any threat from Pakistan, conventional or nuclear. However, it viewed with concern Pakistan's search for sophisticated arms, which was regarded as something 'not in consonance with the pro-cess of normalization of relations between the two countries'.[20] China remained conspicuously absent in Indian threat perceptions in that period. Sino-Indian relations improved despite a lack of any fundamental change in their mutual differences on the boundary dispute. Indian assessment of its overall security environment underlined 'paradoxical developments'.[21] On one hand, there was an admission of growing international efforts to ease tensions but on the other, it reflected an indignation that neither SALT II nor the Comprehensive Test Ban Treaty could be concluded.[22] The Regional security environment was seen to be unstable and uncertain. It therefore, decided that the maintenance of absolute defence preparedness at all times had to remain one of the imperative of its national policy.[23] The 1979-80 Annual Report of the Indian Ministry of Defence emphasized the dangerous implications of the likely transfer of Western military technology to China, and Pakistan's efforts to acquire a nuclear weapons capability needed 'constant and close vigil'.[24] It was the first time that the Pakistan's nuclear pursuits were viewed with concern. Since there was no tangible evidence of any significant achievement in the nuclear field by Pakistan at that time, it did not

---

[20] Annual Report 1977-78: Ministry of Defence, Government of India, (New Delhi, GOI, 1978), p. 2.

[21] Annual Report 1978-79: Ministry of Defence, Government of India, (New Delhi, GOI, 1979), p. 1.

[22] ibid.

[23] ibid.

[24] Annual Report 1979-80: Ministry of Defence, Government of India, (New Delhi, GOI, 1980), p. 2.

appear as a threat in the Indian perception.

In brief, the first Janata government's nuclear policy, particularly under Desai, can be described as a short lived aberration from continuity of the development of a nuclear weapons capability pursued by Mrs. Gandhi. However, the discontinuity was confined to the technological development alone. From a political viewpoint, Desai conceded nothing of substance, but he indulged in a serious dialogue to resolve the Indo-U.S. differences on the issue of nuclear proliferation. As evident from the Delhi Declaration of January 1978, the Indian government emphasized the linkage between horizontal and vertical proliferation which was the fundamental premise of India's NPT policy. Desai appeared equally unwilling to accept full-scope safeguards unless the nuclear weapons states accepted a comprehensive test ban. His restraint on the issue of India's development of nuclear weapons and a willingness to negotiate a solution of the nuclear proliferation problem generated an impression of a moderate stance.

2. INDIAN NUCLEAR POLICY DURING MRS. INDIRA GANDHI'S SECOND-TERM: 1980-1984

On her return to power in 1980, Mrs. Indira Gandhi reaffirmed her government's policy in the Rajya Sabha on 13 March 1980: 'India is committed to the peaceful use of nuclear energy but will not hesitate to undertake nuclear explosions or implosions if such were in the national interest'.[25] Only a month later she expressed concern about Pakistan's pursuit of a nuclear weapons programme and the expansion of China's nuclear weapons capability.[26] She stressed, "India must make an

---

[25] "Gandhi Says National Interest May Require Nuclear Blasts", WASHINGTON POST, 14 March 1980

[26] Worldwide Report: Nuclear Development and Proliferation, No. 37, 3 April 1980, p. 21.

in-depth study of programmes in the neighbouring countries. Moreover, it was imperative that India keep ahead of the latest nuclear developments".[27] Shortly afterwards, she reiterated in the Lok Sabha that her government was not considering a nuclear explosion, but 'We shall go ahead with it if it is believed to be necessary'.[28] It was typical exposition of the previous policy of ambiguity under which her government had carried out the 1974 nuclear test. She also reassured the Rajya Sabha on 27 March 1980,

> Since uranium enrichment programmes are proceeding in India and general preparation to strengthen the defence of the country is a continuing process, overreaction to the reports of Pakistan acquiring the capability to produce weapons-grade uranium is unnecessary. And, there is no need to have a sense of insecurity.[29]

Apparently, Mrs. Gandhi's nuclear policy was to emphasize India's right to carry out more PNEs and be ready to explode one if India's security interests so demanded. However, the protracted Indo-U.S. nuclear negotiations produced an understanding that the Indian government would not go beyond Mrs. Gandhi's statement that India intended to use nuclear energy only for peaceful purposes, 'which does not exclude the possibility of peaceful nuclear explosive experiments' in principle.[30] Practically, she refrained from carrying out another PNE. The existence of such an under-

---

[27] ibid.

[28] Analysis of Six Issues About Nuclear Capabilities of India, Iraq, Libya and Pakistan, p. 25.

[29] Worldwide Report: Nuclear Development and Proliferation, No. 40, 25 April 1980, p. 41.

[30] Text of The Testimony of Warren Christopher, Deputy Secretary of State Before The Senate Committee on Foreign Relations and Committee on Government Affairs, dated June 19, 1980, p. 4.

standing is confirmed from an Indian source as well. The Indian Secretary of the Ministry of External Affairs under Mrs. Gandhi, Mr Eric Gonsalves, provided a confidential assurance to the State Department's officer-in-charge of Proliferation, Mr. James L. Malone, that India would not carry out a 'PNE in a current time-frame'.[31] The assurance was conditional on the efficacy of the U.S. efforts to stop Pakistan from acquiring various elements of a nuclear weapons capability.[32]

The Indo-U.S. understanding did not last long when it was reported in 1983 that India was maintaining the nuclear test site at Pokharan in a state of readiness.[33] In 1984, it was reported that Mrs. Gandhi's government had reassembled the team which carried the 1974 nuclear explo-sion (disbanded by P.M. Desai in 1977) under the supervision of Dr. Raja Ramanna and that India had accelerated work on its nuclear weapons capability.[34] It was further stated that India had initiated work on a scientific technique known as Inertial Confinement Fusion (ICF) at BARC, in which LASERS were being used to achieve a high compression of deuterium or tritium, the isotope of hydrogen used in a fusion bomb.[35] In addition, it was also reported that Mrs. Gandhi had authorized work on the improvement of nuclear weapons design and the fabrication of components.[36] Pakistani sources also concluded that henceforth, India had to be taken as an adversary who can deploy nuclear

---

[31] "U.S. Was Given Assurance Against Nuclear Blast", THE HINDU, 22 February 1982.

[32] ibid.

[33] WASHINGTON POST, 23 June 1983.

[34] 'Shadow of An Indian H-Bomb', pp. 1-2.

[35] ibid.

[36] ibid.

weapons in any future conflict.[37] Therefore, Pakistani nuclear planning focussed upon this development as a fundamental premise of its strategic calculations.

The Indian security environment in the early 1980s was characterized by a perception of Pakistan being massively armed "as a front-line state" by the West. The U.S. led the process because of the Soviet military intervention in Afghanistan and Pakistan becoming a 'part of the so-called strategic consensus'.[38] The transfer of sophisticated arms to Pakistan was deemed far beyond its 'legitimate defence needs'.[39] India believed it would result in a significant qualitative and quantitative augmentation of Pakistan's overall military capability, and tilt the 'delicately poised balance in the region' in favour of Pakistan.[40] The U.S economic and military aid package of $ 3.2 billion to Pakistan was considered a demonstration of the later's renewed strategic importance for the U.S.[41] The provision of sophisticated weapon systems in addition to the aid package, like the F-16s were described as 'patently offensive' and which constituted a 'threat to peace'.[42] Pakistan was seen to have taken full advantage of the continued Soviet presence in Afghanistan by projecting its role as front-line state and

---

[37] Stephen P. Cohen, *PAKISTAN ARMY* (Berkeley, University of California Press, 1984), p. 153.

[38] Annual Report 1981-82: Ministry of Defence, Government of India, (New Delhi, GOI, 1982), p. 1.

[39] ibid.

[40] ibid.

[41] Annual Report 1982-83: Ministry of Defence, Government of India (New Delhi, GOI, 1983), p. 1.

[42] Annual Report 1983-84: Ministry of Defence, Government of India (New Delhi, GOI, 1984), p. 1.

thereby acquiring new and sophisticated weapon systems.[43]

Reports of Pakistan's quest for nuclear weapons capability further intensified the Indian perception of a nuclear threat from Pakistan.[44] The Indian government expressed the urgency to undertake 'utmost vigilance' in view of the reports that Pakistan was attempting to acquire nuclear weaponry.[45] Due to its perception of a deteriorating security environment, the Indian government was determined to take 'appropriate measures' to maintain full defence preparedness.[46] It also felt that India was surrounded by two nuclear weapon states in its immediate neighbourhood, China and the Soviet Union.[47] In addition to that, the U.S. was believed to have deployed powerful task forces in the Indian Ocean which also carried nuclear weapons.[48] However, its main concern focussed upon the understanding that 'Pakistan's relentless pursuit of a nuclear weapons capability with the assistance and connivance of certain countries has added a new dimension to our security environment'.[49]

Mrs. Gandhi continued to concentrate on the emergent Pakistani nuclear threat during the last months of her government. Addressing a group of senior army officers shortly before her death, she described the Pakistani nuc-lear threat as a 'qualitatively new phenomenon in our security environment', and emphasized the urgency of a 'new dimension to the

---

[43] Annual Report 1984-85: Ministry of Defence, Government of India (new, Delhi, GOI, 1985), p. 1.

[44] Annual Report 1981-82, p. 2.

[45] Annual Report 1982-83, p. 2.

[46] Annual Report 1983-84, p. 2.

[47] Annual Report 1984-85, p. 1.

[48] ibid.

[49] ibid.

Indian Defence Management'.[50] While India's apprehensions about a Pakistani nuclear threat appeared genuine, it is worthwhile asking what could be this 'new dimension' to the Indian Defence Management? Did she consider making the Indian air defence so impregnable that no nuclear-capable Pakistani aircraft could penetrate, or to update the Indian nuclear capability to provide a sufficient deterrent against any Pakistani nuclear threat? The subsequent Indian upgrading of its air defence systems and expansion of the nuclear weapons capability under Mrs. Gandhi suggest that she had simultaneously focussed on both the strategies. Her government was engaged in the advancement of a nuclear weapons capability until her assassination in October 1984. She accelerated the momentum of development of nuclear weapons capability. Work at two safeguards-free nuclear power reactors: MAPP I and MAPP II was up-dated. The reactors were commissioned in 1983 and 1985 (MAPP II achieved criticality shortly after her death).[51] The Tarapur Reprocessing Plant began operating at full capacity in 1983-84 and Trombay Reprocessing Plant was refurbished at the same time to increase its output capacity. A comprehensive study by an American specialist concluded that India clandestinely obtained heavy water and used it to run the safeguards-free nuclear powe reactors (MAPP I & II) with the ostensible purpose was to expand its nuclear weapons capability.[52] The foundation of this expansion programme of the Indian nuclear wapons capability was laid by the government of Mrs. Indira Gandhi and followed by the late P.M. Rajiv Gandhi in the 1980s.

---

[50] INDIAN EXPRESS, 15 October 1984.

[51] *NUCLEAR INDIA*, 24 (5 & 6), Department of Atomic Energy, Bombay, 1986.

[52] Gary Milholin, Heavy Water in India (Washington D.C., The Wisconsin Project on Nuclear Arms Control, 1986), unpublished, pp. 1-20.

3. INDIAN NUCLEAR POLICY UNDER MR. RAJIV GANDHI: 1984-1989

Mr. Rajiv Gandhi was relatively less equivocal than his predecessors about the ambiguity pervading the Indian nuclear policy. He often spoke about the shift in policy caused by the nuclear threat from Pakistan. His first six months in office reflected a preoccupation with a Pakistani nuclear bomb. He repeatedly emphasized the 'reconsideration' of India's nuclear policy to meet the Pakistani nuclear threat. In April 1985, he stated that the Indian nuclear policy of not making nuclear weapons is being reconsidered in view of the nuclear threat from Pakistan.[53] He reiterated within a month that India would review its nuclear policy to meet the challenge posed by Pakistan's pursuit of a nuclear weapons capability.[54] In a well publicized interview with *LE MONDE*, Gandhi indicated the possibility that India might have manufactured the components of nuclear weapons and could assemble them rapidly in case of an eventuality [of a nuclear threat].[55] He further highlighted, 'If we decided to become a nuclear power, it would take a few weeks or a few months'.[56] On 24 March 1987, he again stated that India would meet Pakistan's nuclear challenge.[57] In April 1987, he stated that to meet the Pakistani nuclear threat, "the Indian people will not

---

[53] FINANCIAL TIMES, 4 April, 1985.

[54] 'India to Review Nuclear Policy, Says Gandhi', WASHINGTON POST, 5 May 1985.

[55] "Le Monde Interview", *LE MONDE*, 5 June 1985; translated in, Foreign Broadcasting Information Service / South Asia, 5 June 1985, p. E-1.

[56] ibid.

[57] Foreign Broadcasting Information Service / South Asia, 25 March 1987, p. E-1.

be found wanting".[58] There were many similar statements from various Indian cabinet ministers about review of the Indian policy of not making nuclear weapons.[59] However, the statements appeared carefully articulated and never went beyond the reiteration of a stipulated policy review. The general line of argument focussed on the point that India had a superior capability than Pakistan to develop nuclear weapons.

A purely political response was considered to be insufficient to alleviate apprehensions of the Indian public about the rapid development of Pakistan's nuclear weapons capability. The significance of Mr. Gandhi's statements could not be dissociated from the Indian announcement of commissioning its long term project R-5, renamed as DHRUVA: one of the world's largest safeguards-free reactor research with a plutonium production capacity of 25 kg per year.[60]

In the period 1985-1986, Pakistan's quest for nuclear weapons capability continued to dominate Indian threat perceptions.[61] India was determined in stating, 'For our part, we must be cognizant of the fact that Pakistan has moved closer to acquiring the capability to make nuclear weapons, which has an obvious bearing on our security'.[62] By 1987, India appeared certain that Pakistan was on the brink of acquiring nuclear weapons capability.[63] This perception worsened by

---

[58] "India Announces Review of Nuclear Policy", *REUTERS*, 27 April 1987, in FBIS / South Asia, 27 April 1987, p. E.1.

[59] ibid.

[60] RESEARCH REACTORS AT TROMBAY (Bombay, Bhabha Atomic Research Centre (GOI), 1987), pp. 1-2.

[61] Annual Report 1985-86: Ministry of Defence, Government of India (New Delhi, GOI, 1986), p. 3.

[62] ibid.

[63] Annual Report 1986-87: Ministry of Defence, Government of India (New Delhi, GOI, 1987), p. 2.

Pakistan's acquisition of sophisticated weaponry which India considered, 'beyond its needs' and carried 'the most serious consequences for India's security'.[64] India seemed disturbed that U.S. was considering the possible sale of AWACS (airborne warning and control system) to Pakistan in 1986-87. It was seen to have minimal use against Afghanistan but a 'substantial force multiplier effect against India'.[65] AWACS was seen not just as a new weapon system, but a command post in the sky with ability to detect, track and keep under surveillance the Indian Air Force operations along the Indo-Pakistan border.[66] However, the sale of AWACS to Pakistan did not materialize.

India perceived a 'sharp deterioration' in its security environment in this period.[67] The interaction of global and regional developments at the time when India was believed in a 'complex phase of its growth', appeared to generate new security threats.[68] China's force modernization programme was considered to have obvious military overtones and security implications for India.[69] India was apprehensive that China might deploy its nuclear forces in Tibet.[70] Sino-Indian relations suffered a set-back due to India's grant of statehood to Arunachal Pradesh which China regards as a disputed territory. It led to hardening of Chinese stance on the border issue.[71] Chinese capability to produce sophisti-

---

[64] ibid.

[65] ibid.

[66] ibid.

[67] Annual Report 1985-86: Ministry of Defence, p. 3

[68] ibid.

[69] ibid.

[70] ibid.

[71] Annual Report 1986-87, p. 2.

cated weapons and the possibility of transfer of technology to Pakistan was seen as a threat to Indian national security.[72] The Indian assessment reflected a realization that external forces could interact with internal forces of dissent in the political and economic spheres to exacerbate its security problem and therefore, demanded a credible response.[73]

Under the spectre of a Pakistani nuclear threat, India made significant advances in its nuclear weapons capability under Rajiv Gandhi. Leonard Spector reported a change of 'historic proportions' in the Indian security environment in 1986 due to reports of Pakistan's acquisition of the 'essentials of a rudimentary nuclear deterrent of perhaps three to six nuclear devices'.[74] At this time, India further expanded its nuclear weapons capability with special emphasis on nuclear military infrastructure. In late 1986, it announced the development of technology to enrich uranium to any level, including weapons-grade.[75] It was significant, given India's interest in the development of H-bomb technology, because uranium is considered preferable to plutonium in thermonuclear weapons.

In early 1987, India accelerated the development of its nuclear weapons capability, particularly the production of weapons-grade plutonium.[76] The Indian government reiterated its

---

[72] ibid, p. 3.

[73] ibid.

[74] Leonard S. Spector, *THE UNDECLARED BOMB*, p. 88.

[75] Evan Fera and Kannan Srinivasan, 'Keeping the Nuclear Option Open', *Economic And Political Weekly*, 6 December 1986, p. 2119.

[76] 'India's Supply of Unsafeguarded PU Grows As Reprocessing of MAPS Fuel Begins', *Nuclear Fuel*, 11 August 1986, p. 3. Also see Section on reprocessing plants in Chapter Seven and Appendix VI.

determination to maintain technological superiority over Pakistan in the nuclear field, and to counter the Pakistani nuclear threat. India's cabinet ministers often repeated P. M. Gandhi's theme of "reconsideration" of Indian nuclear policy. Defence Minister K. C. Pant, declared during a policy statement in the Lok Sabha, "The emerging threat to us from Pakistan is forcing us to review our options".[77] Similarly, speaking in the Rajya Sabha on the same day, Minister for External Affairs, Mr. N.D. Tiwari stated that India would safeguard its national security by taking all necessary measures against the Pakistani nuclear threat.[78] The emphasis on "reconsideration" of the traditional policy of not making nuclear weapons appeared carefully articulated to focus attention on Pakistan's nuclear development and divert it from the advancement of their own nuclear weapons capability. However, it is not intended to say that the Pakistani nuclear threat to India is imaginary and Pakistan is not attempting to develop a nuclear weapons capability.

India's repeated assertions that it had the capability, but did not produce nuclear weapons appear invalid in view of extensive evidence to the contrary. There were many reports about India's involvement in nuclear weapons research and development. In April 1988, Washington-based press reports citing U.S. officials and intelligence sources disclosed that India was producing nuclear weapons. One report specifically stated that India began producing nuclear weapons in late 1986.[79] Speaking in the Lok Sabha on 25 April 1988 after Pakistan test-fired its first missile (SSM *Haft-1*), Mr. Pant

---

[77] FINANCIAL TIMES, 27 April 1987.

[78] ibid.

[79] Richard Sale, "India Said to Upgrade Nuclear arsenal", United Press International, 25 April 1988, cited in Spector, p. 100.

assured the House that there was "no vulnerable window" in India's defence preparedness and its armed forces would not find themselves at a disadvantage in the event of a nuclear attack by Pakistan.[80] According to K. Subrahmanyam: 'In plain language, this would mean that India has a few bombs in the basement and Pakistan is not being left in any doubt about it'.[81] In April 1989, the WEEKLY TIME MAGAZINE reported an official source from close to the late P. M. Gandhi, that India could produce a nuclear bomb "overnight".[82] As reported, "Indian scientists and engineers are immersed in nuclear weapons and ballistic missiles".[83] In testimony on 18 May 1989 to the Senate Committee on Government Operations, the CIA Director, Mr. William Webster, stated that there were many indications that India was involved in the work on nuclear and thermonuclear weapons.[84] Even if the accuracy of some of these reports might be questionable, no one doubted India's capability to fabricate and deploy nuclear weapons in any future conflict after its 1974 nuclear test, and its continued efforts to expand that capability.

The period under Mr. Gandhi also saw the development of a powerful conventional military capability. India augmented the strength of all the branches of its armed forces under various forms of domestic, bureaucratic and political rationales. It maintained the world's third largest army, fourth largest air force and fifth largest navy, while the

---

[80] K. Subrahmanyam, 'Indo-Pak Nuclear Stand-Off: A Challenge And Opportunity', An unpublished paper, November 1988.

[81] ibid.

[82] WEEKLY TIME MAGAZINE, 3 April 1989, p. 16.

[83] ibid, p. 11.

[84] NEW YORK TIMES, 19 May 1989, p. A7 and WASHINGTON POST, 19 May 1989, p. A29.

sum-total of its armed forces ranked India as the fourth largest military power after the United States, the Soviet Union and China, in quantitative terms.[85] It planned to build a blue-water navy with the induction of a second aircraft carrier (HMS Hermes purchased from Britain and renamed Virat), refurbished the first one (Vikrant) and was locally developing a 30,000 tons third carrier.[86] The navy was equipped with a nuclear-powered submarine acquired on lease from the Soviet Union in January 1988. The submarine, a Charlie 1 class of the 1960s vintage, renamed *CHAKRA*, has the capability of long-range cruising and launching conventional or nuclear missiles.[87] However, it is not equipped with nuclear missiles. Four additional nuclear powered submarines were scheduled to be delivered to India by the Soviet Union. There was some revision in the schedule, but no precise information is available so far.

It was the first ever example where a nuclear weapon state had transferred a nuclear-powered weapon system to a non-nuclear weapon state. It was the first of four nuclear-powered submarines which the Soviet Union agreed to provide. These submarines are usually fueled with highly enriched uranium (weapons-grade), and according to a leading U.S. nuclear specialist, they would provide India access to additional amounts of nuclear-weapons material free from non-proliferation restrictions.[88] However, the apprehension appears

---

[85] This conclusion is based upon a comparative assessment from *MILITARY BALANCE 1989-1990* (London, International Institute for Strategic Studies, 1989).

[86] This data is compiled from the *MILITARY BALANCE 1989-1990*, p. 161, and *Defense and Foreign Affairs*, XVI (12), December 1988, pp. 28-29.

[87] The U.S. Department of Defense, *SOVIET MILITARY POWER* (Washington, USGPO, 1988), p. 26

[88] Spector, p. 101.

an extreme view in the light of restrictions the Soviet Union imposed on the use of the submarines, like periodic inspections, custody over spent fuel, and generally strict Soviet adherence to the objectives of the nuclear non-proliferation regime. India has enough quantities of weapons-grade plutonium for a modest weapons programme.[89] It is more probable that India is interested in acquiring the design of nuclear-powered submarines, and experience in their operation and maintenance. A Pakistani source suggested that India started an indigenous project for developing nuclear-powered submarines in 1976 which failed despite large sums of money spent.[90] The source pointed out differences between the DAE and the Indian Navy about the reactor design for the submarine, and technological difficulties as major reasons of failure.[91] However, naval military acquisitions under Rajiv Gandhi's government equipped the Indian Navy with a long-range, blue-water and offensive capability.

The development of a strong military force was not limited to the navy. The Indian air force was also equipped with a large number of sophisticated aircraft such as, Jaguars, Mirage-2000s and MIG-29s, all of which can be made nuclear-capable after necessary modifications.[92] During Mr. Gandhi's government India added 4 more to its 34 divisions army and had a total of 1.2 million men under arms.[93] In

---

[89] See Chapter Seven, section 3 on weapons-grade material and appendix VI.

[90] Lt. Col. (retd.) E.A.S. Bokhari, 'Defence Notes: Some Facets of Indian Nuclear Military Nuclearization', THE DAILY JANG (London), 7 August 1989.

[91] ibid.

[92] *MILITARY BALANCE 1988-1989*, pp. 155 & 160-162.

[93] ibid.

addition to induction of new weapon systems, like BMP-2 and 155mm Bofor howitzers, indigenous production of weapons systems such as MBT (main battle tank) Vijayanta was speeded up.[94] India test-fired an intermediate range ballistic missile, AGNI (fire) in May 1989, which is potentially capable of carrying nuclear warheads.[95]

The Indian defence budget rose up to $ 9.89 billion in 1988-1989.[96] According to an assessment by the International Institute for Strategic Studies, neither the financial allocations for re-equipment nor the cost of the IPKF (Indian Peace Keeping Forces) in Sri Lanka were included in that budget.[97] The Indian Defence Research and Development Organization spends $ 1 billion annually, and employs 25,000 scientists and engineers.[98] The rapid expansion of Indian armed forces under Mr. Gandhi was unprecedented. According to a report, India's real rate of military growth from 1983 to 1988 'dramatically outstrips the real rate of defense growth in NATO countries in the same period'.[99] With two aircraft carriers, a fleet of 30 guided missile frigates and submarines, an air force consisting 870 aircraft, and an IRBM capability, India is projecting military power well beyond the South Asian region.

Indian conventional military power supplemented by a nuclear weapons capability was not only geared by its

---

[94] ibid.

[95] Fore details, see section 5. C, on India's ballistic missiles capability, in Chapter Seven.

[96] THE MILITARY BALANCE 1988-1989, p. 160.

[97] ibid, p. 155.

[98] WEEKLY TIME MAGAZINE, 3 April 1989, p. 15.

[99] Gregory R. Copley, 'India: A New Great Power Arrives', *Defense and Foreign Affairs*, XVI (12), December 1988, p. 28.

security and foreign policy objectives to counterpoise the Chinese military power and the Pakistani threat, but intended to demonstrate its role as a regional great-power. A Western diplomat in New Delhi believed that India wanted to be taken seriously: 'It wants to be viewed as a world power. That is an end itself'.[100] An Indian naval officer who helped plan the Navy expansion programme, said that one of its goals was to make it too risky by the year 2000 for either superpower to act in a hostile manner to India in the northern Indian Ocean.[101] This indicates that under Mr. Gandhi, India aspired to play a great power role. His government concentrated on building conventional military power and expanded various elements of a nuclear weapons capability to support that role.

4. INDIAN NUCLEAR POLICY IN THE POST-RAJIV GANDHI PERIOD: 1989-1991)

The installation of another Janata government under Mr. V.P. Singh in November 1989 did not result in any major change in India's nuclear policy. Rather, the personal style of Prime Minister Singh was different in its conduct from Rajiv Gandhi's. Mr. Singh avoided, in public at least, being always concerned about Pakistan's development of a nuclear weapons capability. He did not over-emphasize the 'reconsideration' of Indian nuclear policy, which was a hallmark of Gandhi's policy. He demonstrated adeptness in dealing with political pressure from his coalition partners like the BJP (Bhartia Janata Party), which is a fundamentalist Hindu party and favoured an open and immediate nuclear weapons programme

---

[100] 'Superpower Rising', WEEKLY TIME MAGAZINE, 3 April 1989, p. 13.

[101] ibid, p. 17.

in its election manifesto.[102] Mr. Singh seemed inclined to initiate talks with Pakistan on the nuclear issue but also warned that India would be forced to change its nuclear policy of not producing nuclear weapons if Pakistan manufactured such weapons.[103]

However, Mr. Singh appointed a nuclear expert, Dr. Raja Ramanna (who was head of the 1974 explosion team and the Chairman AEC for years) as Minister of State for Defence for his "undoubtedly hawkish nuclear credentials".[104] Dr. P.K. Iyengar (who designed the triggering mechanism for the 1974 device), was appointed Chairman of the AEC.[105] These appointments were looked upon by experts as an indication of further, but undeclared advancement of weapons programme by Mr. Singh's government.[106] In late 1989, the West German authorities discovered that 250 metric tons of heavy-water was clandestinely exported to India by a West German nuclear smuggler, Alfred Hempel.[107] In April 1990, Romania's President announced that the former communist government of Nicolai Ceausescu had provided 12.5 tons of Norwegian heavy-water to India.[108] According to Spector and Smith, these two men, 'almost certainly were involved in India's apparently illicit heavy-

---

[102] 'India Should Produce Nuclear Weapons', <u>*Defense And Foreign Affairs Weekly*</u> 2-8 October 1989, pp. 2-3.

[103] Foreign Broadcasting Information Service / NES, 21 February 1990, p. 48.

[104] Spector with Smith, p. 78.

[105] <u>ibid</u>.

[106] <u>ibid</u>.

[107] "Heavy-Water Transferred", *DIE TAGESZEITUNG*, 7 October 1989, translated in JPRS-TND, 6 November 1989.

[108] Michael Gordon, 'Romania is Reported in Nuclear Deal with India', <u>NEW YORK TIMES</u>, 30 April 1990.

water acquisitions'.[109] They further noted that India has demonstrated 'persuasively to have relied on clandestine nuclear purchases to expand its nuclear weapons capability', and therefore, 'New Delhi has lost claims to transparency and has created deep grounds for suspicions about its intentions'.[110]

The most significant development under Mr. Singh's government was that the DAE allocated $ 1.4 billion for heavy-water during 1989-1990 to meet deficiencies caused by domestic production shortfalls.[111] During the period 1989-1990, India was in dire need of heavy-water free from international safeguards for the continued operation of its safeguards-free nuclear reactors, like MAPP I & II and DHRUVA. It also started operating a new 235 MW (e) safeguards-free power reactors, NARORA I in 1990 and planned to operate NARORA II in 1991.[112] Each of these reactors has a plutonium production capacity of 60 kg per year, which would augment India's stockpile of safeguards-free plutonium for further expansion of its nuclear weapons capability.[113] India was reported to be continuously producing large quantities of fissile plutonium in 1989 which significantly enhanced its weapons capability.[114] Further reports suggested that Mr. singh's government was preparing the second test of the AGNI (fire), Intermediate-range ballistic missile, to be followed by large-scale production of

---

[109] Spector and smith, p. 78.

[110] ibid, p. 73.

[111] Rita Manchanda, 'Heavy-Water Drought', *Far Eastern Economic Review*, 31 August 1989. p. 1.

[112] *World Nuclear Industry Handbook* (Sutton-Surrey, Nuclear Engineering International, 1990).

[113] See Appendix II.

[114] 'Kalpakkam Nuclear Power Plant Set for Production', TIMES OF INDIA, 12 October 1989.

the missiles. But no second test has yet taken place.[115]

Since early 1990, normalization in Indo-Pakistan relations reached imminent collapse with the upsurge of the freedom movement in the Indian-held Kashmir which increased the prospect of an other war over the Kashmir dispute.[116] Strong fears were expressed that if a war broke out, both the parties might have ready access to nuclear weapons.[117] Former Chief of Staff of Indian Army, General (retd.) K. Sundarji indicated the possibility that India might have 'usable nuclear weapons' if required.[118]

V.P. Singh was replaced by Mr. Chandra Shekar as Prime Minister in early 1991, running a minority government with parliamentary support from Rajiv Gandhi's Congress Party. It had a short tenure because the Congress Party withdrew its support apparently over the provision of refuelling facilities to the U.S. aircraft during the Gulf war. No significant development was reported in the nuclear field which could affect the process underway for the expansion of a nuclear weapons capability. The Shekar government was too short lived and politically instable to take any important decisions. As a result of the new parliamentary elections held in June 1991, the Congress Party could not win a majority, but was able to form a government with support from small groups. During the process, the Congress Party suffered a great loss in Mr. Rajiv Gandhi's tragic death in a terrorist's suicidal bomb blast. The party was able to agree on the nomination of Mr. Narsima

---

[115] 'India Prepares New Agni Tests, Production', Defense and Foreign Affairs Weekly, 26 February - 4 March 1990, p. 1.

[116] 'Growing Fears of Clash Over Kashmir,' FINANCIAL TIMES, 30 January 1990.

[117] Spector with Smith, p. 79.

[118] General K. Sundarji, 'The Nuclear Threat' *India Today*, 30 November, 1990, p. 94.

Rao as Prime Minister. The prospects of Congress Party being able to remain in government are better than any other because it is the single largest parliamentary party. Given Mr. Rao's long and close association with Mrs. Indira Gandhi and Rajiv Gandhi, there is a greater possibility that he would follow the nuclear policy of expanding the weapons capability undertaken by their governments.[119] Being a Minister for External Affairs, he had continuously defended India's right to carry out more PNEs if considered necessary for Indian national interest and rejected proposals for the application of full-scope safeguards on its nuclear programme.

5. SECOND NUCLEAR DEBATE (1980s)

Since the early 1980s, Pakistan's pursuit of a nuclear weapons capability has provided a rationale to the pro-bomb lobbyists in India to intensify their campaign in favour of the development of nuclear weapons. A large number of officials, defence specialists, and members of the media and political elite have demanded that India must develop an open nuclear weapons programme.[120] Some believe that India, in fact, already possesses nuclear weapons and official denials are only diplomatic in nature.[121] Others staunchly support the view that a nuclear Pakistan is potentially dangerous to Indian national security and therefore, India must develop nuclear weapons.[122] The division within the Indian polity has

---

[119] Mr. Rao was initially the Minister of External Affairs, but then became the Minister for Home Affairs under Rajiv Gandhi.

[120] An entire issue of an Indian periodical, *World Focus*, 2(6), 1981, is dedicated to the nuclear debate.

[121] P.C. Lal, 'We probably Have the Bomb', *World Focus*, 2 (6), June 1981, pp, 14-15.

[122] Ibid.

gradually coalesced in favour of India's development of nuclear weapons. There are some shifts within the pro-bomb lobby about the urgency of acquiring nuclear weapons.

K. Subrahmanyam, who used to represent the moderates, is now leading the hawkish component of the pro-bomb lobby. His association with Indian government circles also make his views more credible. He has described the current debate on the acquisition of nuclear weapons as an "Indian Dilemma" buried under an 'enormous overburden of myths'.[123] According to him, it is a myth that nuclear weapon states, 'especially the US is committed to non-proliferation, if not in the sense of their own proliferation of nuclear weapons but at least to other countries'.[124] He stated that the record showed the U.S. and Western powers had been conniving at selective proliferation even while they were negotiating the so-called Non-Proliferation Treaty.[125] Israel, South Africa and Pakistan are cited as example of selective cases. To him, it is another myth that nuclear weapons are safe in the hands of nuclear weapon powers, their allies and clients but not in the hands of others. He argued,

> In the current global strategic environment in which, against our opposition, nuclear weapons have been made an international currency of power and surrounded by three nuclear weapon powers of the world, it is absurd for a country of India's size, population and resources to talk of non-alignment and keeping her options open by renouncing nuclear weapons.[126]

Subrahmanyam believes that a 'non-nuclear India

---

[123] K. subrahmanyam (ed.), *NUCLEAR MYTHS AND REALITIES: INDIA'S DILEMMA* (New Delhi, ABC Publishing House, 1981), p. i.

[124] ibid, p. ii.

[125] ibid.

[126] ibid, p. vi.

cannot have even a regional role, let alone a global one'.[127] He believes that India's acquisition of nuclear weapons would not be in violation of Gandhian non-violence. According to him, 'No doubt Gandhiji expressed himself against the atom bomb but that was long before the nuclear weapons became the legitimate international currency of power'.[128] He believed that the NPT highlighted the technological hegemony imposed upon the developing nations by the nuclear-weapon powers, who are continuously attempting to legitimize their 'monopolistic' nuclear arsenals and assist 'clandestine' proliferation to their clients like Israel and South Africa. A retired Indian Admiral, Krishan Nayyar's opinion reflects the intensity of pro-bomb sentiment. He stated, 'The world has learned to live with U.S power, Soviet power, even Chinese power, and it will have to learn to live with Indian power'.[129]

With the gradual development of nuclear weapons capability by Pakistan, Indian public opinion has further swayed in favour of India's development of nuclear weapons. An opinion poll for the SUNDAY OBSERVER suggested that 82 per cent of the respondents wanted India to produce nuclear weapons and 45 per cent favoured a pre-emptive strike on Pakistan's nuclear facilities.[130] It further indicated that 32 per cent of the respondents believed that India already had atomic weapons and 70 per cent believed that Pakistan too possessed nuclear weapons.[131] It is important to note that the opinion poll was carried out just after the interview of the

---

[127] ibid, p. vii.

[128] ibid, p. ix.

[129] 'Superpower Rising', WEEKLY TIME MAGAZINE, 3 April 1989, p. 13.

[130] 'Atom bomb programme favoured in Indian poll', THE INDEPENDENT, 9 March 1987.

[131] ibid.

Pakistani nuclear scientist, Dr. Abdul Qadeer Khan, to THE OBSERVER. Dr. Khan reportedly stated that Pakistan possessed the atomic bomb.[132] The likelihood of Indian respondents being influenced by that report and its impact in favour of the atomic bomb cannot not be ignored.

However, it is a reflection of India's democratic character that the anti-nuclear lobby has not entirely disappeared. A group of distinguished Indian scientists, parliamentarians, authors, academics, journalists and elder statesmen has been formed under the name of a Committee for a Sane Nuclear Policy (COSNUP). Professor Dhirendra Sharma is convener of the Committee. It may not be able to influence the final outcome of the nuclear debate as a majority of the Indian decision-making elite seems determined to reconsider the official policy of not acquiring nuclear weapons. However, it might contribute to redress the prevailing imbalance in the nuclear debate in India. The following paragraph from the manifesto of COSNUP provides an insight into its thinking:

> It is presumptuous to claim that India, the pre-eminent state in the Sub-continent, is being driven to go nuclear by Pakistan. Where does our responsibility lie in directing the course of history of our unfortunate region?* * * [W]e believe that the onus rests with us for the decision whether this region should go nuclear or not.* * * Along with Pakistan we should seek ways of ensuring that India, Pakistan, and the whole of South Asia and the Indian Ocean remain a nuclear free zone.[133]

The Indian nuclear establishment is coming under increasing pressure from various organized and vocal environmental groups after nuclear accidents the world over, like Chernobyl in the

---

[132] Kuldip Nayyar, 'Pakistan has the A-Bomb, Says Dr. Strange Love', THE OBSERVER, 1st March 1987.

[133] Nuclear Proliferation in South Asia: Containing the Threat; A Staff Report to the Committee on Foreign Relations, United States Senate, 100 Congress, 2nd Session (Washington, U.S. Government Printing Office, 1988), p. 17.

U.S.S.R. There were many demonstrations against the establishment of two power reactors at Narora Atomic Power Project (NAPP) near Delhi.[134] The demonstrators demanded their scrapping.[135] Dr. Sharma suggested its conversion into an electricity producing centre by natural gas.[136] There were also protests against the Kaiga Atomic Power Project by the members of another anti-nuclear group, CANE (Citizens for an Alternative to Nuclear Energy).[137] Kaiga is located only 15 km from a wildlife sanctuary and less than 100 km from known seismic faults. CANE members believe that radio-active contamination from Kaiga would endanger the environment and the fragile ecology of the surrounding forests.[138]

6. REGIONAL NUCLEAR DIPLOMACY (1980s):

There was no significant interaction between India and Pakistan in the field of nuclear diplomacy before the 1974 Indian nuclear test. Both countries signed the Partial Test Ban Treaty in 1963 immediately after its conclusion, but Pakistan did not ratify until 1988.[139] No official explanation has been offered by Pakistan for withholding ratification for so long time. Most probably, it was due to future uncertainties in view of India's lead in the field of underground nuclear explosion technology, and its interest in carrying out more such explosions. A fundamental differencece between India

---

[134] 'India's Nuclear Fallout,' *South*, July 1988.

[135] ibid.

[136] ibid.

[137] ibid.

[138] ibid.

[139] United Nations, DISARMAMENT NEWSLETTER: World Disarmament Campaign, 7 (5), October 1989, p. 8.

and Pakistan on the issue of a PNE is that Pakistan considered it indistinguishable from a weapon test.[140] General Zia departed to some extent from this view.[141] Pakistan was behind India in its nuclear programme to the extent that it had not established even a single nuclear installation by then. As noted in the previous chapter, its first nuclear research organization, known as PINSTECH (Pakistan Institute of Nuclear Science and Technology) was established in 1965.[142] Its first research reactor, PARR-1 (Pakistan Atomic Research Reactor), was also completed in 1965.[143]

India and Pakistan adopted different approaches to the NPT, although neither signed it. Pakistan actively participated in the NPT negotiations, but unlike India, it hailed its conclusion and expressed hope that all the potential nuclear-weapon states would join it.[144] In an apparent response to the Indian objections against the NPT that it was a "discriminatory" treaty, Pakistan thought that it was not "realistic to impose obligations on the nuclear powers similar in all respects to those which the treaty placed on the non-nuclear weapons states".[145] However, despite its general support for the NPT and the associated objectives, Pakistan

---

[140] THE NEAR-NUCLEAR COUNTRIES AND THE NPT (Stockholm, Stockholm International Peace Research Institute, 1972), pp. 25-26.

[141] See General Zia's nuclear policy in the previous chapter.

[142] PINSTECH 1965-1985, (Islamabad, PINSTECH-PAEC, Government of Pakistan, 1985), p. 3.

[143] Annual Report 1873-74, (Islamabad, PAEC, 1974), p. 13.

[144] DOCUMENTS ON DISARMAMENT: 1968 (Washington DC, U. S. Arms Control and Disarmament Agency, 1968), p. 317.

[145] ibid, pp. 318-319.

did not sign it because of India's refusal.[146] The official explanation offered by Pakistan for not signing was stated as follows:

> In the final analysis, the position of Pakistan with regard to signing the treaty will turn on considerations of its enlightened national interest and national security in the geo-political context of the region in which Pakistan is situated.[147]

Pakistan accepted international safeguards on all its nuclear installations until 1974 when India carried out its nuclear test. All of its three nuclear installations by then, PARR-1, KANUPP (Karachi Nuclear Power Project) and the controversial reprocessing plant to be installed under the Franco-Pakistan agreement of 1976 were under safeguards.[148] It was only after the 1974 Indian nuclear test that Pakistan decided to develop a nuclear weapons capability and refused to accept full-scope safeguards. India on the other hand, had sought nuclear technology from Canada and U.S. in the 1950s under ambiguous terms and refused to accept international safeguards on most of its nuclear installations. After India's nuclear test, Pakistani Prime Minister, Z.A. Bhutto desperately sought a nuclear security guarantee against the Indian nuclear threat or blackmail. He instructed the Minister of State for Foreign Affairs, Mr. Aziz Ahmad, to explore the possibility with U.S. officials at the CENTO Ministerial Meeting at Washington which was coincidentally scheduled immediately after the Indian test.[149] Reportedly, the U.S. was not inclined to provide such a guarantee. Bhutto visited Moscow in early

---

[146] THE NEAR-NUCLEAR COUNTRIES AND THE NPT, 26.

[147] ibid.

[148] See previous chapter and Appendices IX & X for details.

[149] "Test Puts India in Firing Line", GUARDIAN, 24 May 1974.

October 1974 to seek Soviet support for a proposal to declare South Asia a nuclear weapons-free zone (NWFZ), but the Soviet leaders showed a lack of support for his fears about the Indian nuclear threat to Pakistan and did not support the proposal.[150]

In the absence of a security guarantee, the lack of support for his nuclear-weapons free-zone proposal, and Pakistan's week conventional military capability, Bhutto's alternatives were indeed extremely limited. He proposed at the U.N. General Assembly session on 28 October 1974 to declare South Asia a Nuclear-Weapons Free-Zone.[151] The Political Committee of the General Assembly endorsed the Pakistani proposal by 82 votes in favour to 2 against (India and Bhutan) with 36 abstentions.[152] India opposed the proposal on the plea that the initiative for the proposal should come from the countries of the region and not the U.N.[153] However, despite the endorsement of the Pakistani proposal, there was a general skepticism about its eventual success in view of Indian opposition. Neither the U.S. nor the Soviet Union showed any enthusiasm.[154] India remained opposed to the Pakistani proposal for a NWFZ. In August 1980, Mr. Swaran Singh as India's chief delegate to 23rd Session of the General Conference of the IAEA again rejected Pakistan's proposal to establish a nuclear weapons free zone in the South Asian region.[155] In the follow-

---

[150] "Moscow Bars Bhutto Bid on A-Free Zone", NEW YORK TIMES, 27 October 1974.

[151] "Pakistan Urging Atom-Free Zone", NEW YORK TIMES, 29 October 1974.

[152] NEW YORK TIMES, 21 November 1974.

[153] ibid.

[154] ibid.

[155] International Atomic Energy Agency, 23rd Regular session (GC XXIII) OR. 215, August 1980, p. 17.

ing General conference, Dr. Sethna reiterated Indian view that the non-proliferation regime was discriminatory, and said, 'vertical and horizontal proliferation should be approached simultaneously and in the same way'.[156]

During General Zia's regime, Pakistan offered India a wide range of nuclear arms control proposals, such as: creation of a nuclear-weapons free-zone in South Asia; simultaneous signatures to the NPT by India and Pakistan; mutual acceptance of the IAEA safeguards; bilateral inspection of each other's nuclear facilities; joint declarations to renounce the development of nuclear weapons; and signing a regional test ban treaty.[157] The NWFZ proposal was Bhutto's while the remaining five originated during Zia's rule. In 1981 Zia offered Mrs. Gandhi a proposal for mutual inspection of each other's nuclear installations, but she never responded to that.[158] After the inception of Rajiv Gandhi's government in October 1984, Zia launched a "peace offensive" to improve Indo-Pakistan relations and resolve the nuclear issue. He reiterated his proposal of mutual inspections to P.M. Gandhi in November 1984 at a press conference in New Delhi and complained about the lack of Indian response despite three years of its initiation.[159] He received a response from Mr. Gandhi, who promised to pursue nuclear negotiations with Pakistan.[160] The Zia-Gandhi initiative provided a temporary relief in the deteriorating nuclear competition between India and Pakistan. In a joint communique on 17 December 1985, they

---

[156] International Atomic Energy Agency, 24th Regular Session (GC XXIV) OR. 220, February 1981, p. 12.

[157] *CONGRESSIONAL RECORD*, 5 August 1988, p. S11005.

[158] ibid.

[159] *Nucleonics Week* 25 (45), 8 November 1984, p. 9.

[160] ibid.

announced a verbal understanding that India and Pakistan would not attack each other's nuclear installations.[161] However, the understanding could not be formalized into a written agreement during Zia's lifetime due to worsening of mutual relations and allegations of interference in each other's internal affairs.

The Pakistani nuclear arms control proposals were reiterated by Prime Minister Mohammad Khan Junejo in 1986. He offered to accept binding obligations if India reciprocated.[162] In September 1987, while addressing the UN General Assembly, Junejo not only repeated the earlier offers but also proposed that India and Pakistan should have a mutual agreement on a regional test ban.[163] India rejected these proposals on the plea that they failed to address its perception of a Chinese nuclear threat and treat India and Pakistan as relative equals, thereby, elevating Pakistan's importance despite India's far greater size and economic-cum-military power.[164] India also rejected the proposed regional test ban by saying that it could await the adoption of a comprehensive test ban by the nuclear weapon states.[165] It believed that the Pakistani proposals were meant to isolate India in the non-proliferation forums and therefore, lacked credibility. Indian decision-makers considered these proposals as part of an

---

[161] THE PAKISTAN TIMES (Rawalpindi), 18 December 1985.

[162] "Pakistan Says 'No' to Bomb, 'Yes' to Non-Proliferation", *Christian Science Monitor*, 18 July 1986.

[163] Text of the Address of His Excellency Mr. Mohammad Khan Junejo, Prime Minister of the Islamic Republic of Pakistan at the Forty-Second Session of the United Nations General Assembly (New York, Embassy of Pakistan, 24 September 1987), pp. 10-12.

[164] "India Not in Favour of Regional Disarmament", News India, 14 November 1987.

[165] ibid.

"insincere diplomatic offensive" by Pakistan.[166]

India's refusal to test the credibility of Pakistani non-proliferation initiatives marred progress of nuclear arms control between the two states. In October 1987, during his visit to Washington, Rajiv Gandhi rejected President Ronald Reagan's appeal that India enter into a dialogue with Pakistan on the nuclear issue.[167] On the contrary, Gandhi demanded that the U.S. should apply pressure on Pakistan to stop the advancement of its nuclear weapons programme.[168] During Gandhi's government, Indian nuclear diplomacy focussed on containing the further development of the Pakistani nuclear programme through pressure from the West, particularly the U.S., and refused to negotiate on a bilateral basis. It was obvious that accepting Pakistani proposals or any similar measure based upon a regional arms control approach would lead to reciprocal limits on its nuclear weapons capability. It was not acceptable to India. Relying on U.S. pressure meant that India would not have to make parallel concessions through bilateral negotiations with Pakistan.

Instead of addressing regional nuclear issues at a bilateral level with Pakistan, India has continued to advocate comprehensive nuclear disarmament. In the late 1980s, Indian nuclear diplomacy focussed upon drawing global attention on the issues of nuclear proliferation through a Five Continent Peace Initiative. This initiative was jointly proposed by India, Argentina, Mexico, Tanzania, Sweden, and Greece.[169] The Five Continent Peace Initiative entailed

---

[166] ibid.

[167] "India-Pakistan Talks Urged", WASHINGTON POST, 21 October 1987.

[168] ibid.

[169] Nuclear Proliferation in South Asia: Containing the Threat; A Staff Report to the Committee on Foreign Relations,

periodic summits, expert's meetings, and publicity efforts. It primarily focussed on general and complete disarmament. The initiative was ignored by Western arms control experts, but viewed favourably by many Third World countries.[170] Those who did not appreciate the initiative believed that it could not be taken seriously unless two of its members, India and Argentina, were willing to address their nuclear programmes.[171] Until then, it would be an eye-wash in the nuclear diplomacy.

In 1987, Mr. Gandhi proposed a three-tier approach to nuclear disarmament during his visit to Washington. This approach categorized three types of states: (i) the superpowers (the United States and the Soviet Union); (ii) the great powers (China, France, and U.K.); and (iii) the near-nuclear nations (India, Pakistan, Argentina, Brazil, Israel, South Africa).[172] According to the proposed approach, each tier would have different obligations. The superpowers would be obliged to reduce their nuclear arsenals. In this connection, the INF Treaty and any such prospective agreements were viewed by India as an improvement in the non-proliferation environment.[173] The second-rank nuclear powers would be obliged to freeze their arsenals at current levels. However, for Britain and France, such a freeze would have to be accompanied by an agreement to redress the East-West imbalance of conventional forces in the European theatre. Finally, the near-nuclear states would agree to remain non-nuclear.[174]

United States Senate (Washington DC, USGPO, 1988), p. 21.

[170] ibid.

[171] ibid.

[172] ibid, pp. 21-22.

[173] ibid, p. 22.

[174] ibid.

On the basis of available information, the three-tier approach appeared a unique and positive step. However, there is no evidence of any interest shown by the states mentioned in the proposed approach except India. Its basic assumption of three categories of nuclear states contradicted India's traditional policy on the NPT, which divided the world into nuclear and non-nuclear weapon states, and India regarded as "iniquitous" and "discriminatory".[175] The proposal lacked any institutional framework to translate the recommendations into practice. No provisions for verification and inspection arrangements were suggested. Despite these fundamental questions, three-tier approach deserved to be further explored. It appeared as a fundamental departure from India's traditional nuclear policy on the issue of nuclear proliferation. How far this change in the Indian nuclear policy would be translated into practice is yet to be seen? However, viewed in the light of other determinants of Indian nuclear weapons capability, it appears that India might be buying time through such proposals to ward off pressure for adhering to some form of non-proliferation. There is no further evidence of India's interest in the three-tier approach after Rajiv Gandhi's tenure of government ended in 1989.

In late December 1988, encouraging steps for nuclear restraint in South Asia were undertaken. At the fourth SAARC (South Asian Association for Regional Cooperation) Summit in Islamabad, India elicited a call from the SAARC leaders for an early conclusion of a comprehensive test ban treaty to be proposed at the Geneva Conference on Disarmament.[176] However, more encouraging development of the Summit was the formaliza-

---

[175] See Chapter Four, section 3 on India's NPT policy.

[176] Text of the Islamabad Declaration, issued at the end of the fourth SAARC Summit concluded in Islamabad on 31 December 1988; *Strategic Studies* (Islamabad), XII (2), Winter 1988, pp. 95-97.

tion of Indo-Pakistan understanding reached between General Zia and P.M. Gandhi in December 1985 (not to attack each other's nuclear installations) into a binding agreement.[177] This development was possible due to a better personal understanding between Benazir Bhutto, who assumed power in early December 1988 and Rajiv Gandhi. The main provision of the agreement is that:

> Each Party shall refrain from undertaking, encouraging or participating in, directly or indirectly, any action aimed at causing the destruction of, or damage to, any nuclear installation or facility in the other country.[178]

The agreement is a significant step towards further confidence building measures between the two countries once it is ratified.

Another proposal between India and Pakistan was under discussion in 1988 through U.S. mediation. According to the proposal, India and Pakistan would each place one of its safeguards-free nuclear facility of the other's choice under safeguards.[179] The verification of the postulated arrangement could be by either the IAEA or bilateral safeguards monitored by inspectors from the other country. This proposal has certain attractions for both countries. Conceptually, it would alleviate a long standing Pakistani grievance of discrimination vis-a-vis India. In practice, Pakistan would have to be prepared to put under safeguards its only source of fissile material, Kahuta uranium enrichment plant which would be an obvious Indian choice. India might have to put one of its premier R & D establishments, like BARC (Bhabha Atomic

---

[177] Text of the Agreement Between India and Pakistan on, "No Attack on N-Plants", Article I, *Strategic Studies*, pp. 98-99.

[178] *ibid*.

[179] *Nuclear Proliferation in South Asia: Containing the Threat*, p. xi.

Research Centre), or PREFRE (Power Reactors Fuel Reprocessing) under the safeguards. However, India would not be deprived of its sources of safeguards-free fissile material, because it has many other facilities for the production and reprocessing of plutonium.[180] Despite obvious advantages of the proposal to India, its response was described as 'lukewarm', while Pakistan's attitude was 'favourable'.[181] India showed limited interest without any commitment. P.M. Gandhi personally found the proposal to be "an idea worthy of further exploration", but other Indian officials' attitude was non-committal.[182]

The U.S. sources appeared optimistic because of the potential advantages to India of a proposal that 'effectively caps Pakistani nuclear programme' but preserved India's capability, and therefore, indicated the possibility that India might accept the proposal.[183] The fact that India would still be in a position to continue its nuclear weapons programme to develop a limited deterrent against China seemed to be the basis of that optimism. Nonetheless, certain difficulties were overlooked for the proposal to succeed in view of the complexities of nuclear deadlock in South Asia. The proposal did not address existing stockpiles of safeguards-free fissile material present in both states' inventories. Pakistan is thought to have enough material for several devices and India can launch a limited nuclear weapons programme on the basis of existing stockpile of plutonium.[184]

---

[180] See Chapter VII on Indian nuclear reactors and reprocessing plants.

[181] <u>Nuclear Proliferation in South Asia: Containing the threat</u>, p. xi.

[182] <u>ibid</u>.

[183] Ibid.

[184] Spector and Smith, for India, pp. 63-88, for Pakistan pp. 89-117.

Both countries would be able to develop a limited number of nuclear weapons, though India's capability would be greater than Pakistan's. Given the prevailing state of hostility and suspicion between the two nations, neither would find the proposal an effective solution to the nuclear threat.

Moreover, the proposal is likely to be ineffective in view of India's capability to install more safeguards-free nuclear reactors and plutonium reprocessing plants. Pakistan can also build more facilities. In fact, available press reports suggest that Pakistan is already building a second enrichment plant at Golra near Islamabad.[185] By the time the proposal might become operative in some institutional form, it might be out of date. This leads to the conclusion that any proposal aimed at building technological barriers is likely to fail unless it addressed the fundamental political questions which generate such technological and military momentum. Therefore, the proposal might fall short of even a temporary confidence building measure.

India's hesitation to endorse the proposal is understandable. India's nuclear programme is based upon an integrated fuel cycle. Indian officials are bound to be concerned that placement of one nuclear facility under safeguards would affect the integrity of complete nuclear cycle. Placing one sensitive nuclear facility under safeguards requires full monitoring of that facility and the nuclear material processed in that facility. Under this proposal, the plutonium reprocessed in a safeguarded plant would become subject to safeguards.[186] If the safeguarded material would be transferred to another facility, the safeguards would follow and apply to the material at the new facility. However, once the

[185] Simon Henderson, "Pakistan Builds Second Plant to Enrich Uranium", FINANCIAL TIMES, 11 December 1987.

[186] Nuclear Proliferation in South Asia: Containing the Threat, op. cit. pp. 23-24.

safeguarded material left, the safeguards would not be applicable on that facility.[187]

Another proposal being explored by the Indian, Pakistani and U. S. non-proliferation experts is a "Greater South Asia Nuclear-Weapons-Free-Zone".[188] This proposal is in response to Indian objections against the Pakistani proposal for a Nuclear-Weapons-Free-Zone (NWFZ) in South Asia. India opposed Pakistani proposal because it did not incorporate Indian concerns about nuclear threats it perceived from China and the U.S. deployment in the Indian Ocean.[189] The Greater South Asian NWFZ proposal sought an agreement to ban nuclear weapons from the Subcontinent, their deployment in Tibet and other parts of China adjacent to India, and from the Indian Ocean.[190] It appears a comprehensive proposal which took into account the entire spectrum of nuclear threats to India and meets the requirements of the Pakistani South Asian NWFZ.

However, discussions are confined to diplomatic circles so far and there is no public information available. The official responses of China, India, Pakistan and the superpowers are not available for analysis. Nonetheless, some of the likely responses may be speculated. The Chinese nuclear threat to India is a low intensity one because its nuclear capability was primarily directed against the Soviet Union. Non-deployment of Chinese nuclear weapons in Tibet would certainly minimize the nuclear threat to India, but not eliminate it. There cannot be a credible guarantee that China

---

[187] ibid.

[188] ibid, p. 24.

[189] Captain Zafar Iqbal Cheema, 'South Asia as a Nuclear-Weapons Free-Zone', *Strategic Studies* (Islamabad), 4 (2), Winter 1981, pp. 32-46.

[190] Nuclear Proliferation in South Asia: Containing the Threat, p. 24.

has not or will not deploy nuclear weapons against India in other territories. India may not be willing to foreswear its nuclear deterrent for any such incredible assurances against a nuclear threat. It might be potentially attractive for China to assure non-deployment of nuclear weapons in Tibet in lieu of a non-nuclear India on its southern borders. It might not entail any major reorientation of its strategic policy, because China has already made a "no-first use" declaration against the NNWS which includes India. But it may not be willing to forego its option to deploy nuclear weapons in Tibet against the Soviet Union. The process of determining the possible direction and targets of Chinese nuclear deployment there would be extremely tedious because of technological complexities involved in such a determination. China may not be willing to let an extensive verification and inspection system be instituted which might affect the credibility of its deterrent against the Soviet Union. Any Chinese assurances without a verification system would not be acceptable to India.

A similar proposal originating from India with semi-official recognition is a triple-zero option for Asia.[191] It stipulates: i) elimination of all medium to short-range weapon systems (5,000 to 500 km range) and battle-field (less than 500 km range) land, sea and air-launched nuclear weapons from the continental land mass of Asia, the Pacific and Indian Ocean up to a distance of 5,500 km; ii) corresponding commitment by nations of Asia not to develop or acquire nuclear weapons; iii) strategic nuclear weapons in Asia and elsewhere to be brought within the framework of negotiations in progress between the two superpowers at present; iv) an assurance by the nuclear weapon states to the signatories of a triple-zero

---

[191] Jasjit Singh, 'Southern Asia and the Nuclear Threat', *Strategic Analysis*, New Delhi, XII (1), April 1988, pp. 10-11. Jasjit Singh is a retired Air Commodore and presently the Director of the IDSA.

option that nuclear weapons will not be used or threatened to be used against them, pending the elimination of strategic weapons; v) all states to agree not to attack the nuclear installations of states party to the triple-zero option; and vi) mutual verification and inspection mechanisms to ensure compliance with non-deployment and non-development of nuclear weapons by every state.[192] The proposal not only covers a far broader ground than any of the known initiatives, including a comprehensive test ban treaty, but is also full of contradictions and complications.[193] Therefore, it can hardly be acceptable for serious negotiations.

It is noteworthy that India did not reject the proposals about general nuclear disarmament. The Indian policy on every meaningful nuclear arms control and disarmament solution reflects an inextricable linkage to its claim for general and complete nuclear disarmament. A U.S. expert believes that because of the elusiveness of general and complete disarmament as an attainable objective, India's linkage of non-proliferation to disarmament has been a "smokescreen for inaction on the nuclear issue".[194]

Recently, Pakistan has proposed a five nation conference to resolve the issue of the nuclearization of South Asia in which the United States, the Soviet Union, China, India and Pakistan would participate.[195] Pakistan's Prime Minister, Nawaz Sharif, has called upon the three great powers to sponsor urgent negotiations between the two South Asian rivals on the nuclear issue. While the U.S. and China sup-

---

[192] ibid.

[193] ibid.

[194] Nuclear Proliferation in South Asia: Containing the Threat. p. x.

[195] 'Pakistan Seeks Talks On Nuclear Curbs', INTERNATIONAL HERALD TRIBUNE, 7 June 1991.

ported the Pakistani proposal, India rejected it immediately and said, 'We find nothing new in these suggestions'.[196] There is no response from the Soviet Union.

India's nuclear diplomacy has failed to some extent to cope with the non-proliferation issues stated above, and it has not offered any viable alternative. It has rejected Pakistan's bilateral initiatives aimed at regional non-proliferation, the acceptance of which would expose the inherent ambiguity of Indian nuclear policy. Pakistan's nuclear diplomacy appears comprehensive enough to incorporate regional as well as international non-proliferation proposals. It seeks regional denuclearization with India while hoping that general and complete nuclear disarmament, whenever it comes, would be compatible with any regional framework. India demands first and foremost, international nuclear disarmament, and unless that is achieved, it rejects regional disarmament. The above argument does not impute any peaceful versus military motives on either side on this issue. Both countries are pursuing military programmes under the garb of peaceful development. India's problem originates from the global orientation of its nuclear diplomacy whereas Pakistan's advantage is that its nuclear diplomacy is fundamentally Indo-centric and therefore, has an advantage in negotiating a regional solution with India. Pakistan, on the other hand, has been plunged into a deadlock with the U.S. over linkage between its nuclear programme and the continuation of economic and military assistance.

India's covert nuclearization is gradually advancing under the doctrine of nuclear ambiguity. The doctrine of nuclear ambiguity seems to be based upon certain perceived advantages. India can continue to claim itself a non-nuclear weapon state and thereby derive benefits from the ambiguity,

[196] 'Pakistan's atomic plan rejected', THE INDEPENDENT, 8 June 1991.

like the availability of economic and sophisticated technological assistance from the West and the Soviet Union. Loss of such assistance would seriously undermine the momentum of India's technological and industrial development. Overt nuclearization might activate deployment of China's nuclear weapons against India, for which there is no evidence so far. China might also consider withdrawing its no-first use offer to India once it deployed nuclear weapons. In that case, India would have to incur the economic cost of sustaining a nuclear arms race with China which it might not win in the immediate future.

As a counterpoise to the growing nuclear threat from Pakistan, this strategy has many advantages over the open development of a nuclear arsenal. It would provide sufficient deterrence against Pakistan. In future conflict-situations, Pakistani military planners, even by conservative assumptions, would have to assume that given India's present state of nuclear advancement, it can deploy nuclear weapons as a retaliatory measure. Covert nuclearization helps to avoid exacerbation of bilateral nuclear tensions and restrains an open ended nuclear arms race between the two. Even if India is certain to lead such an arms race against Pakistan due to its large economic, industrial and technological base, it would be impossible for it to escape a Pakistani nuclear deterrent of some size. India's rejection of all the Pakistani nuclear arms control proposals is motivated by its doctrine of nuclear ambiguity.[197] This is considered the best strategy by the Indian decision-makers until India is able to develop a strategic triad on the superpower model, i.e. land based intercontinental ballistic missiles (ICBMs), strategic bombers and submarine-based ballistic missiles (SLBMs). As will be discussed in the next chapter, India is already heading in

---

[197] See section 6 above.

that direction. Until then, covert nuclearization helps avoid the high economic cost of the deployment of nuclear forces, without the loss of opportunity for the clandestine research and development of a strategic nuclear capability. Over the years, Indian arguments for the acquisition and advancement of its nuclear weapons capability have multiplied. New justifications are added without earlier ones being dropped. Under one rationale or the other, India has refused to allow verification of its claim that it has not been pursuing the development of nuclear weapons.

The doctrine of nuclear ambiguity is deliberately misleading to buy time for enlarging its existing capability. According to the WEEKLY TIME MAGAZINE, a top Indian official recently conceded that India deliberately fosters ambiguity about its nuclear capabilities, but off-hand remarks suggest that India has nuclear-weapons components on the shelf and a special team ready to assemble them.[198] An open declaration of a nuclear deterrent would be the next inevitable step once the nuclear weapons capability has advanced to a stage from where nuclear weapons could be fully integrated into the armed forces and military doctrines developed for their use. Selig Harrison from the Carnegie Endowment for International Peace noted that Indian scientists were facing problems in developing IRBM nose cones and guidance systems, but added, 'When they overcome the technical problems and are in a position to deploy IRBMs, they'll be looking for ways of going nuclear in a public way'.[199]

The most significant determinant of Indian nuclear weapons capability in the 1980s was its preoccupation with the development of a comprehensive military capability, in addition to a Pakistani nuclear threat. The imperatives of

---

[198] WEEKLY TIME MAGAZINE, 3 April 1989, pp. 16-18.

[199] ibid.

security, strategic reassurance, great-power status and domestic political pressure weighed heavily in the Indian decision-making to expand its nuclear weapons capability. Indian pursuit of strategic power leads to the conclusion that a nuclear weapons capability would be an integral component of its force posture. It is difficult to say precisely when India would declare the existence of a public nuclear force, but it can be expected around the turn of the century. Much depends on the development of its missiles programme which is discussed in the next chapter. However, an Indian specialist in nuclear science policy, Dr. Sharma, anticipates that given its stockpiles of plutonium and 'massive investment in IRBMs', India would publicly turn to the nuclear deterrent option within the next five years, thereby proclaiming its great power status.[200] Most probably, India would wait to develop various ingredients of a strategic triad before declaring its nuclear weapons capability, unless forced by Pakistan into an earlier decision.

---

[200] ibid, p. 17.

Chapter Seven

INDIAN NUCLEAR WEAPONS CAPABILITY: AN ASSESSMENT

The Nuclear weapons capability of a country originates from the size and sophistication of its nuclear industry, availability of fissile material (weapon-grade plutonium or uranium), expertise in nuclear military technology, and a political commitment to allocate the requisite economic resources. Although actual development of nuclear weapons is fundamentally a political decision, technological direction of a state's nuclear capability is an important differential of its peaceful or military intentions. This differential assumes a special significance if that state deliberately fosters ambiguity in its nuclear policy and pursuit of a nuclear weapons capability through the use of dual-purpose technologies. It refuses to allow the verification of its claim about an exclusively peaceful intent by rejecting the application of international safeguards on its nuclear programme. It is yet another criterion for the evaluation of its policy and weapons capability. Finally, the development of adequate delivery systems, like ballistic missiles, potentially capable of carrying nuclear weapons, indicate the course a country might be taking towards the acquisition of nuclear weapons.

India appears to be such a case. It maintains a large-scale, well developed and self-sufficient nuclear programme which provides it a solid basis for a nuclear weapons capability. It is the leading Third World country with a nuclear programme which has demonstrated a consistent growth and technological progress. It employs dual-purpose nuclear technologies. India is the sixth nation to carry out a nuclear test, and ninth to achieve a complete nuclear fuel recycle capability.[1] It has indigenous expertise and technological infrastructure to design, construct and operate nuclear power stations. It has carried out extensive research, especially in the field of reactor theory. It has large quantities of weapons-grade plutonium free from international safeguards which can be used to develop a sizeable nuclear force. Many reports suggest that India has developed nuclear weapons components and assembled several low-yield nuclear weapons, but the Indian government denies the validity of those reports. Indian Air Force has sophisticated aircraft to develop an aircraft-based nuclear delivery system.

A similar policy applies to the Indian space programme which is described as entirely peaceful, despite launching ballistic missiles from installations established with substantial foreign assistance and commitment for 'only peaceful use'. India has test-fired an Intermediate-range ballistic missile, Agni (fire) which has the potential for adaptation as a nuclear delivery system. It has a rapidly expanding space programme to enhance its IRBM capability in the immediate future and provide the basis for an inter-continental ballistic missile capability in the long-term. There is no public evidence so far that India has integrated nuclear weapons into its military structure or developed explicit command, control and communication (C^3) systems for the deployment of nuclear weapons. However, the contemporary developments in the region may force India to do so. All these issues are discussed in detail in the subsequent sections of this chapter which assesses India's nuclear weapons capability and delivery systems. This assessment is carried out in the light of a wide range of recently available evidence.

---

[1] Status of being ninth country to have achieved a full nuclear recycle capability is claimed in, Annual Report 1975-1976: Department of Atomic Energy (Bombay, GOI, 1976), p. 26. The other eight countries are: The U.S., the U.S.S.R., the U.K., France, F.G.R., Japan, Canada and Sweden.

1. THE GENESIS OF INDIAN NUCLEAR PROGRAMME

The genesis of the Indian nuclear programme pre-dates independence. The establishment of Tata Institute of Fundamental Research (TIFR) under Dr. Homi Jehangir Bhabha in 1945 marked the inaugural phase of the programme.[2] An adequate scientific base for it had already existed in the later years of the British Raj. The University of Calcutta, a premier scientific institution, was established in 1876. In the same year, Indian Association for Cultivation of Science was created. Bose Institute, founded in 1917, had demonstrated significant achievement in natural science research. In 1942, Indian Council of Scientific and Industrial Research (ICSIR) was commissioned to initiate and promote cooperation among scientific institutions and the industrial sector. As noted in Chapter Three, the Indian nuclear programme received the supervision of Dr. Bhabha in its formative phase.

Dr. Bhabha was born in Bombay on 30 October 1909 and began his education at Elphinstone College and the Institute of Science at Bombay.[3] In 1927, he joined the Cambridge University and studied at Gonville and Caius Colleges. After doing a tripos in mechanical sciences in 1930, he worked (1931-32) in the Covendish Laboratory where in 1932 Chadwick discovered the Neutron.[4] In 1934, he won the Isaac Newton studentship, completed his Ph.D. in 1935, and worked at Cambridge until 1939 when he returned to India.[5] The time in

---

[2] Dr. M.R. Srinivasan, 'Reminiscences of Homi Bhabha', *Nuclear India*, Vol. 25, No.5-6 (Bombay, Department of Atomic Energy, Government of India, 1987), p. 12.

[3] 'Homi Bhabha: The Pioneer of India's Nuclear Programme', *Nuclear India*, 23 (2), 1984, p. 6.

[4] *ibid*.

[5] *ibid*.

Europe proved significant for his personal development as an accomplished nuclear physicist. He worked with outstanding scientists like Pauli in Zurich, Fermi in Rome, Kramer in Utrecht, and Sir John Cockcroft and Lord Blackett in Britain.[6] He also had close associations with Albert Einstein and a Nobel Laureate, Hideki Yukawa. Bhabha made an original contribution to electron-position scattering, acknowledged as 'Bhabha Scattering'.[7] At the beginning of World War II in 1939, Bhabha was in India and could not return to Cambridge. In 1940, he undertook a research assignment in cosmic rays at the Indian Institute of Science at Banglore as a professor. In 1944, Bhabha was successful in seeking financial support from the Dorab Tata Trust and the government of India to set up the Tata Institute of Fundamental Research which was commissioned on 19 December 1945 under his supervision.[8] He devoted the rest of his life to build scientific institutions in India.

Initially, India drew an interim plan to promote various uses of atomic energy. First 'four-year' interim plan was unveiled by the Atomic Energy Commission in January 1953. It envisaged the installation of various plants for processing atomic minerals like uranium ores and producing uranium and thorium compounds.[9] These included a monazite processing plant at Alwaye (constructed by the Indian Rare Earths Limited), a uranium processing at Trombay and another such plant at Bihar.[10] The plan was hailed by the Indian press as "a major advance in the development of atomic energy with the implemen-

---

[6] Cockcroft and Menon, pp. 5-6.

[7] 'Homi Bhabha: The Pioneer of India's Nuclear Programme,' pp. 6-7.

[8] ibid.

[9] Department of State, Central Decimal File 891.2546 / 1-1353, dated 13 January 1953.

[10] ibid.

tation of a four-year plan" drawn up by the Atomic Energy Commission.[11] Further details about the plan were provided to the Lok Sabha by the Minister of Natural Resources and Scientific Research in March 1953. These were as follows: i) survey of India for atomic minerals, ii) construction of atomic reactors, iii) setting up a medical division in the AEC, iv) setting up a biological division for the use of atomic techniques, v) setting up a pilot plant for the extraction of uranium from low grade ores and copper tailings, vi) setting up a plant for processing uranium from the residual cake left after rare earth chlorides and carbonates have been extracted from monazite, and vii) setting up a plant for processing uranium to the "state of atomic purity".[12]

In 1954, Dr. Bhabha prepared the long-term, three stage nuclear development strategy.[13] Subsequent development of the Indian nuclear programme took place within the framework of that three stage development strategy. New plans were introduced, but they did not alter the fundamental premise of the development strategy. Initial legislative work on atomic energy was carried out from 1948 to 1954 to provide legitimacy for administrative authority and organization.[14] Since then, the set up of the Indian nuclear programme has developed into a big organization and it has assumed diverse functions. A study of all aspects of India's civilian nuclear programme is beyond the scope of this thesis. An organizational chart is provided on the next page for a complete description.

---

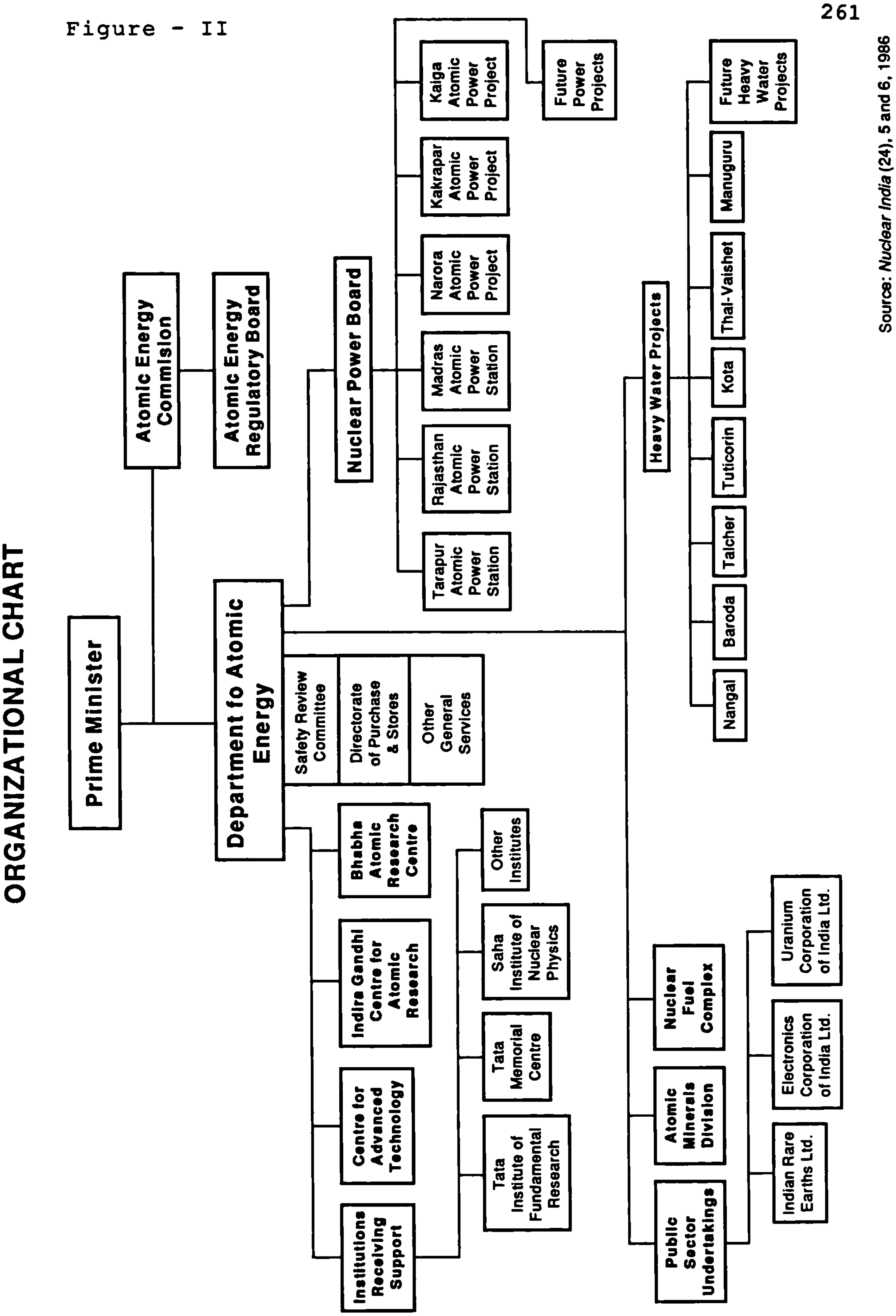
[11] TIMES OF INDIA (New Delhi), 10 January 1953, cited in the Department of State file referred above.

[12] Department of State, Central Decimal File, 891.2546/-3-1453, dated 14 March 1953.

[13] See section 2 in Chapter Three.

[14] The administrative framework of India's nuclear programme during the Nehru era is discussed in Chapter Three, Section 4 for the sake of coherence in the theme.

Figure - II


ORGANIZATIONAL CHART
Prime Minister
Atomic Energy Commision
Atomic Energy Regulatory Board
Department fo Atomic Energy
Safety Review Committee
Directorate of Purchase & Stores
Other General Services
Nuclear Power Board
Tarapur Atomic Power Station
Rajasthan Atomic Power Station
Madras Atomic Power Station
Narora Atomic Power Project
Kakrapar Atomic Power Project
Kaiga Atomic Power Project
Future Power Projects
Heavy Water Projects
Nangal
Baroda
Talcher
Tuticorin
Kota
Thal-Vaishet
Manuguru
Future Heavy Water Projects
Bhabha Atomic Research Centre
Indira Gandhi Centre for Atomic Research
Centre for Advanced Technology
Institutions Receiving Support
Tata Institute of Fundamental Research
Tata Memorial Centre
Saha Institute of Nuclear Physics
Other Institutes
Nuclear Fuel Complex
Atomic Minerals Division
Public Sector Undertakings
Indian Rare Earths Ltd.
Electronics Corporation of India Ltd.
Uranium Corporation of India Ltd.
Source: Nuclear India (24), 5 and 6, 1986

2. NUCLEAR POWER PROGRAMME

Bhabha first concentrated on the primary technological objectives for the Indian nuclear programme in the 1950s. These objectives were: i) laying the foundation of a fully self-reliant and long-term nuclear programme, ii) training a large cadre of nuclear scientists and technicians initially from abroad, but eventually at home, iii) acquisition of technical know-how for designing, manufacturing and operating nuclear equipment and installations, iv) acquisition of manufactured technologies in the interim period, like research reactors, nuclear power plants and nuclear fuel technologies, v) undertaking nuclear fuel prospecting and recovering, vi) shifting the technological thrust of the programme from the acquisition and development of natural uranium to plutonium-thorium, and then to uranium-233 (U-233) fuelled reactors to generate nuclear power, and finally, vii) the completion of all objectives within a period of 20 to 25 years.[15]

Bhabha managed to train of a large number of nuclear scientists from abroad and develop technological expertise to start the programme by the time he started establishing research and power reactors. Later, the training of nuclear scientists and technicians shifted from foreign to national institutions. Scientists trained in Britain, Canada, France, Switzerland and other West European countries were large in number, although no accurate figures are available. Several Indian scientists attended the 'Isotope School' at Harwell in Britain where they learned techniques for using radioactive

---

[15] These objectives are collated from many documents: Annual Reports (1960-61 to 1989-90), Department of Atomic Energy, Government of India; Department of the State, Atomic Energy Central Files 891.2546 / 1-1353, 891.2546/2-2053, 891.2546 / 3-1453, and 891.2546 / 4-253; and *Nuclear India*.

materials.[16] The United States Atomic Energy Commission (AEC) trained 939 Indian nuclear scientists from the mid-1950s to 1960s.[17] While self-reliance and self-sufficiency remained primary objectives of the Indian nuclear development strategy, there was also a considerable degree of emphasis on economic viability, fuel availability and early indigenization.

After carrying out the preparatory groundwork and training essential manpower from abroad, Bhabha's attention focussed on the installation of nuclear research and power reactors. He first acquired research reactors to provide operation and maintenance experience to a wide cadre of nuclear scientists. Simultaneously he continued negotiations for power reactors with Britain, Canada, the U.S. and the Soviet Union. His priority was to install pressurized heavy-water reactors fuelled with natural uranium under the first phase of the nuclear development strategy. Despite his best efforts, he could not install such a reactor in his lifetime because of the protracted process of negotiations and the prospective suppliers' demand for safeguards against the non-peaceful use of the reactors. However, he succeeded in getting safeguards-free research reactors and related technologies at an early stage when apprehensions about proliferation of nuclear weapons were not profound. Later on, it became difficult to acquire nuclear technology without acceptance of international safeguards.

The central objective of India's nuclear programme is the generation of nuclear power for agro-industrial purposes, but simultaneously laying down the foundation of a nuclear weapons capability. The entire programme is so indivisibly integrated that it is difficult to distinguish which

---

[16] Department of State, Central Decimal File 891. 2546 / 1-1353, dated 13 January 1953.

[17] Don Oberdorfer, 'U.S. Training Aid in Indian A-Blast Cited', WASHINGTON POST, 19 July 1976, p. A1.

of the two objectives had precedence. However, as discussed in Chapter Three, the completion of technological infrastructure for a weapons option (CIRUS reactor and Trombay Reprocessing Plant) earlier than the installation of nuclear power plants indicates that developing a weapons option enjoyed priority over the generation of electric power.

2.a. RESEARCH REACTORS

From 1956 onwards, India started establishing research reactors. This endeavour complemented the initial objectives to complete construction of research and technological establishments. It helped create Indian facilities for the scientists to gain experience in reactor operation and maintenance. India established three reactors in Bhabha's lifetime, ASPARA in 1956, CIRUS in 1960 and ZERLINA in 1961.[18] ASPARA's design, and technical assistance in its installation was provided by Great Britain.[19] Canada provided CIRUS. ZERLINA was an indigenous effort.[20] These reactors were important to train personnel for nuclear research with particular focus on reactor concepts, new assemblies, and lattice investigations.[21] It also promoted the development of reactor technology, production of fissile plutonium (in the case of CIRUS), manufacture of special materials and radio-isotopes.[22] ZERLINA

---

[18] RESEARCH REACTORS AT TROMBAY (Trombay-Bombay, BARC-DAE, GOI, 1987). Document No. 400 085, July 1987.

[19] ibid.

[20] Annual Report 1960-61: Department of Atomic Energy (Bombay, GOI, 1961), pp. 3-5.

[21] NUCLEAR PROLIFERATION AND SAFEGUARDS, (Washington DC, Office of Technology Assessment, the United States Congress, June 1977), Vol. II, Pt. 1 Appendix, Table B-1, p. 229.

[22] ibid.

was decommissioned in 1983 after 22 years of service in studying reactor concepts and components.[23] Three more research reactors were established in the post-Bhabha period. Two of these reactors, PURNIMA and DHRUVA, are located at the BARC (Bhabha Atomic Research Centre). The third, KAMINI, is located in Kalpakkam at the Indira Gandhi Centre for Atomic Research (IGCAR).[24] PURNIMA I was established in 1972, replaced by PURNIMA II in 1985 and again replaced by PURNIMA III in 1987.[25]

DHRUVA is one of the largest thermal research, safeguards-free reactors in the world with a 100 MW (t) and 25 kg Plutonium production capacity per year.[26] Its construction started in 1975 as the R-5 Project which was renamed DHRUVA on 29 september 1983. It was initially expected to be commissioned in 1983-84, but delays postponed operation until November 1986.[27] Initially, it began operating at 25 to 40 MW (t) capacity.[28] No precise information is available whether it is running at full capacity 100 MW (t). In addition to two nuclear power reactors whose details are described after this sub-section, DHRUVA is the third most important reactor for India's nuclear weapons capability.[29] KAMINI and PURNIMA-III are both U-233 (plutonium oxide) fueled reactors meant to

---

[23] *Nuclear India*, 22 (7 & 8), 1984, p. 2.

[24] Annual Report 1986-1987: Department of Atomic Energy (Bombay, GOI, 1987), p. 5.

[25] ibid.

[26] ibid.

[27] RESEARCH REACTORS AT TROMBAY, and Annual Report 1983-1984: Department of Atomic energy (Bombay, GOI, 1984), p. 4 & 19.

[28] Annual Report 1986-87: Department of atomic Energy, p. 5.

[29] The other two are nuclear power reactors, MAPP I & II. For details see section 2.b. below on nuclear power reactors.

carry out research in fast breeder reactor technology and neutron radiography.[30] All these reactors are free from safeguards except ASPARA which is under British safeguards. CIRUS was meant for only peaceful use but there were no provisions in the agreement for the verification of the peaceful use.[31] These reactors proved extremely useful in developing a solid foundation for the Indian nuclear programme and experimentation in new technologies. (See appendix-I for complete data on India's atomic research reactors).

2.b. NUCLEAR POWER REACTORS

As noted in the introduction, this study does not question the legitimacy of Indian nuclear programme for civilian purposes. Therefore, a lengthy discussion on this issue is avoided to save space for substantive question of its employment for a weapons capability which is the primary focus of the thesis. However, an evaluation of Indian nuclear weapons capability is not possible without an analysis of the nuclear programme because they are fully integrated. Therefore, essential aspects of the nuclear power programme are discussed. One of the primary objectives of India from the beginning has been to generate electricity from nuclear power for agro-industrial, medical, commercial and many related fields. Nuclear power was considered potentially unlimited in view of India's vast reserves of thorium for which the development strategy was designed to utilize. For full utilization of its stipulated power generation output, India developed the concept of Nuclear-power agro-industrial

---

[30] Annual Report 1986-1987: Department of Atomic Energy, p. 5, and *Nuclear India*, 25 (7 & 8), 1987, p. 7.

[31] Details are provided in Chapter Three, section 2.

complex.[32] The concept entailed use of electricity generated in nuclear power stations by closely located consuming industrial complexes like fertilizer, chemical and water-desalination plants, and irrigation centres.[33] Many of these complexes are located or planned to be located in the Indo-Genetic plains in Utter Pradesh and Kutch-Saurashtra region in Western India. The objective was to economize the whole system by connecting the production units with the consumer units and thereby, secure the financial and technological viability not only of the nuclear power stations but also electricity consuming industrial complexes.

India's first atomic power station installed at Tarapur (TAPS) has two uranium enriched reactors despite Bhabha's preference for PHW reactors. India procured these reactors on favourable terms from the U.S when the later perceived Indian economic and industrial progress as a model of development against communism. The reactors were provided under the terms of the Indo-U.S nuclear agreement signed on 8 August 1963 on Cooperation for Civil Uses of Atomic Energy.[34] Both the reactors at the Tarapur Atomic Power Station (TAPS I & II) were constructed by the U.S. General Electric Company. TAPS I & TAPS II are both boiled-water reactors fueled by enriched uranium, each with a 200 MWe (Gross) and 190 MWe (net) power generation capacity, and 60 kg Plutonium

---

[32] NUCLEAR ENERGY PROGRAM-INDIA (U), The U.S. Defense Intelligence Agency, Directorate for Scientific and Technical Intelligence, p.14.

[33] ibid.

[34] Text of the Agreement for Cooperation between the Government of the United States and the Government of India Concerning the Civil Uses of Atomic Energy, signed on 8 August 1963 at Washington.

production capacity per year.[35] Both the reactors require 21 tons of enriched uranium fuel per year and are under the IAEA-U.S. safeguards.

After the 1974 Indian nuclear test and the divergence of opinion about its aims between India and the U.S., the later demanded full-scope safeguards which India rejected.[36] Consequently, the supply of enriched uranium remained disrupted until it was completely stopped in 1985, when the U.S. abrogated the nuclear cooperation agreement. India was forced to operate both the reactors at lower capacity (TAPS I at 148 MWe and TAPS II at 160 MWe).[37] In the same year (1985), India concluded an agreement with France for the provision of enriched uranium fuel for the TAPS reactors. The U. S. approved the Indo-French agreement, and India accepted the continued maintenance of the IAEA safeguards on the reactors. However, there is a controversy between the U.S. and India about the possible use of spent fuel recovered from the Tarapur reactors from 1969 to 1985 because of the abrogation of the original agreement.[38]

As noted earlier, Bhabha's death in an air crash at Mont Blanc in June 1966 was a serious blow to the Indian nuclear programme. In addition to the technological setbacks, international efforts to stem the proliferation of nuclear weapons technology were also stepped up from 1966 onwards.

---

[35] *NUCLEAR POWER REACTORS IN THE WORLD: 1986 Edition* (Vienna, IAEA, 1986), p. 26.

[36] Ravindra Tomar, 'The Indian Nuclear Power Programme: Myths and Mirages', *Asian Survey*, XX (5), May 1980, p. 524. For detailed U.S. assessment of the 1974 Indian nuclear test, see Chapter Four section 5.a, pp. 136-54.

[37] *NUCLEAR POWER REACTORS IN THE WORLD: 1986 Edition*, p. 26.

[38] A detailed discussion of this controversy is provided in section 3 of this chapter on nuclear weapons material.

Both the two superpowers undertook concerted diplomacy for an early conclusion of the NPT. India's two main nuclear suppliers, the U.S. and Canada put pressure on India to sign the NPT. Lack of financial resources also slowed implementation of the programme. From 1966 to 1970, there was no significant progress in India's nuclear power programme except the completion of two reactors at the Tarapur Atomic Power stations.

NUCLEAR POWER PROGRAMME IN THE 1970s (SARABHAI PROFILE)

Bhabha's successor, Dr. Vikram Sarabhai was also a competent nuclear scientist. He undertook a reassessment of the Indian nuclear programme to give it a new impetus and recover from the setbacks. He worked out a 10 year nuclear plan (1970-1980) which was known as Sarabhai Profile.[39] In comparison to Bhabha's primary focus on the nuclear programme, the new plan placed equal emphasis on the development of atomic energy and space technology. This plan fixed specific targets in the generation of atomic power and parallel development in space technology. The essential features of the Sarabhai Profile in the field of atomic energy were as follows:[40] i) 2,700 MW of electricity (atomic power) to be commissioned by 1980, which meant an augmentation of the previous target of 1,700 MWe by an additional 1,000 MWe through installation of more atomic power stations, ii) design and construction of advanced thermal reactors of 500 MW unit size to lower the capital cost and produce enough plutonium for fast breeder reactors and R & D purposes, iii) design and construction of fast breeder test reactor (FBTR), iv) augmen-

---

[39] ATOMIC ENERGY AND SPACE RESEARCH: A PROFILE FOR THE DECADE 1970-1980, (New Delhi, Government of India, 1970).

[40] ibid.

tation of heavy-water production capacity up to 400 tons per year to meet the increasing demand of India's PHW reactors, v) early completion of Nuclear Fuel Complex at Hyderabad, vi) augmentation of plutonium reprocessing facilities at commercial scale, and vii) development of gas centrifuge uranium enrichment technology.

Like Bhabha's nuclear development strategy, DR. Sarabhai's original contribution was his strategy for launching a space research and development programme (which will be discussed below in the section on India's nuclear delivery systems). His contribution in atomic energy was an up-dating of the targets fixed under Bhabha. The Indian government endorsed the Sarabhai Profile and allocated Rs. 1,250 crores for the nuclear programme and Rs. 105 crores for the space programme.[41] This plan was a remarkable endeavour at policy planning, which undertook to augment the atomic power generation capacity by 1,000 MWe and develop related infrastructure in nuclear technology. However, it proved too ambitious, and has not been achieved even today.

Three nuclear power stations, each with two reactors, achieved varying degrees of progress during the period 1970-1980. These stations are: Rajasthan Atomic Power Station (RAPS I & II reactors), Madras Atomic Power Station (MAPS I & II reactors), and Narora Atomic Power Project (NAPP I & II reactors).[42] Only one reactor became fully functional on a permanent basis in that period. The establishment of RAPS I & II was India's first venture in PHW reactors. It was expedient because of Canada's generous financial and technological support, and availability of domestic natural uranium. Both reactors have a power output capacity of 202 MWe (net) and 60

---

[41] Annual Report 1970-1971: Department of Atomic Energy (New Delhi, GOI, 1971), Appendices 1 & 5, pp. 159-60.

[42] This data is compiled from Annual Reports from 1970-71 to 1980-81, Department of Atomic Energy, GOI.

kg Plutonium production capacity per year.[43] RAPS I and II were planned to be commissioned in 1972 and 1974 respectively.[44]

RAPS I achieved criticality in May 1972 and commenced commercial operation in December 1973, but the reactor never became fully functional after Canada withdrew its assistance because of the 1974 Indian nuclear test. It experienced 251 outages (breakdowns) until the end of 1981 and its performance has remained far below the target, achieving an overall capacity factor of only 31 per cent.[45] Immediately after the resumption of operation in 1982, it again broke down and remained closed until February 1985, and developed leakages in May 1985.[46] This has been India's most trouble plagued reactor. It was put into operation again with fuel assistance from France in 1988-89. It is under the IAEA safeguards. RAPS II progressively incorporated more indigenization after the Canadian suspension of materials. It was commissioned in October 1981, started commercial scale operation in April 1982 and its performance has been quite satisfactory with a capacity factor of 77 per cent.[47] RAPS II was developed through indigenous efforts, but came under the IAEA safeguards because India imported 456 tons of heavy-water for its operation from the Soviet Union which insisted for the application of safeguards.[48]

---

[43] NUCLEAR POWER REACTORS IN THE WORLD: 1986 Edition, p. 26.

[44] ibid.

[45] *Nuclear India*, 23 (1), 1984, Special Issue, p. 6.

[46] ibid.

[47] *Nuclear India*, 24 (5 & 6), 1986, p, 2.

[48] William C. Potter, 'Soviet Nuclear Export Policy', in J.C. Synder and Samuel F. Wells jr. (eds.), *LIMITING NUCLEAR PROLIFERATION* (Cambridge Mass: Ballinger Publishing Company, 1985), pp. 213-252.

The Indian nuclear programme suffered serious setbacks in the period 1970-1980, particularly after its 1974 nuclear test. The key element in these setbacks was the termination of nuclear cooperation and assistance by Canada and U.S. Canadian reaction was more severe and immediate than the U.S. Canada alleged India of violating the nuclear cooperation agreement under which the CIRUS reactor was provided. After a special cabinet meeting, the Canadian Prime Minister announced the suspension of all aid programme to India except food supplies.[49] After failing to seek Indian adherence to the NPT or full-scope safeguards, Canada unilaterally abrogated its nuclear cooperation agreement with India in 1976. The U.S. also condemned the Indian nuclear test and refused to accept the Indian interpretation that it was meant for peaceful purposes.[50] The nuclear power stations nearing completion, RAPS, MAPP and NAPP, and other major projects suffered delays ranging from eight (8) to ten (10) years. An Indian official acknowledged the delays and did not reject the impact of the Canadian decision.[51] India only installed a nuclear power capacity of 1100 MWe against the planned output of 2,700 MWe.[52]

The entire Indian nuclear programme suffered varying degrees of delays. The main reasons for the delay were the Canadian and U.S. post-1974 nuclear policies vis-a-vis India under which nuclear cooperation was terminated. India could not visualize that while planning the 1974 test. The Sarabhai

---

[49] DAWN (Karachi), 24 May 1974, p. 1. An account of Canada's interpretation of the 1974 Indian nuclear test is provided in Chapter Four, Section 5.

[50] Details of the U.S. response to the Indian nuclear test are discussed in Chapter Four, section 5.

[51] Raja Ramanna, 'A 15 Years Nuclear Programme for India', *Strategic Digest*, November 1984, p. 1291.

[52] *ibid*.

Profile was also an ambitious piece of planning which set up targets that could not be achieved.

India's most successful experiment in establishing atomic power stations is the Madras Atomic Power Station at Kalpakkam near Madras, with two PHW reactors (MAPS I & II). Based upon Canadian designs, each reactors has a power output capacity of 220 MWe (net) and 235 MWe (Gross), with a 60 kg plutonium production capacity per year.[53] They became operational in July 1983 and August 1985 respectively.[54] These are also the first of India's nuclear power reactors free from international safeguards because these were built by Indian scientists locally, with 88 per cent indigenous components.[55] India is known to have started extracting plutonium from these reactors by 1985-86.[56] Another nuclear power station built through totally indigenous efforts is Narora Atomic Power Project (NAPP) installed at Narora in Utter Pradesh. It has two PHW reactors (NAPP I & II), each with a power output capacity of 220 MWe (net) and 235 MWe (gross), and 60 kg plutonium production capacity per year.[57] NAPP I commenced operation in 1990 and NAPP II was expected to begin operation in 1991, but there might be some delay.[58] Both these reactors will add significantly to the Indian stockpile of weapons-grade material because they are free from international safeguards.

---

[53] *NUCLEAR POWER REACTORS IN THE WORLD: 1986 Edition*, p. 26.

[54] *Nuclear India*, 24 (5 & 6), 1982, p. 2.

[55] *Nuclear India*, 24 (1), 1985, p. 11.

[56] NUCLEAR WEAPONS AND SOUTH ASIAN SECURITY, p. 9.

[57] *WORLD NUCLEAR INDUSTRY HANDBOOK* (Sutton, Nuclear Engineering International, 1990).

[58] Annual Report 1988-1989: Department of Atomic Energy (Bombay, GOI, 1989).

NUCLEAR POWER PROGRAMME FROM 1980 TO 1985:

From 1980 to 1985, India undertook additional projects in all fields of atomic energy, without completing the earlier ones. Four additional atomic power stations, two more reprocessing plants, and many heavy-water units planned in this period are in preliminary stages of development. Two PHW reactors, RAPS III and RAPS IV, are planned for installation at Rajasthan Atomic Power Station, with power generation and Plutonium production capacities identical to RAPS I & II, i.e. 220 MWe and 60 kg Pu per year.[59] India has also started work for the fabrication of materials for Kaiga Atomic Power Project at Kaiga in Karnatka with two PHW reactors, KAIGA I & II, each with a 220 MWe power output capacity and 60 kg Plutonium production capacity per year.[60] These reactors are expected to be operational in 1994 and 1995 respectively. Construction work was reported to be progressing at another project, Kakrapar Atomic Power Project with two PHW reactors, KAPP I & II, each with a power output capacity of 220 MWe (net) and 235 MWe (gross) and a Pu output capacity of 60 kg per year.[61] India intends to build its first plutonium fueled fast breeder power reactor (FBR) of 500 Mwe by end of the current century.[62] Conventional systems and plant structure is reportedly completed.[63] See appendix-II for complete data on India's atomic power reactors. A graph on the growth of manpower in the 1980s (available figures) is provided in figure -III on the next page to avoid lengthy description).

---

[59] *Nuclear India*, 24 (5 & 6), 1986. p. 3.

[60] ibid.

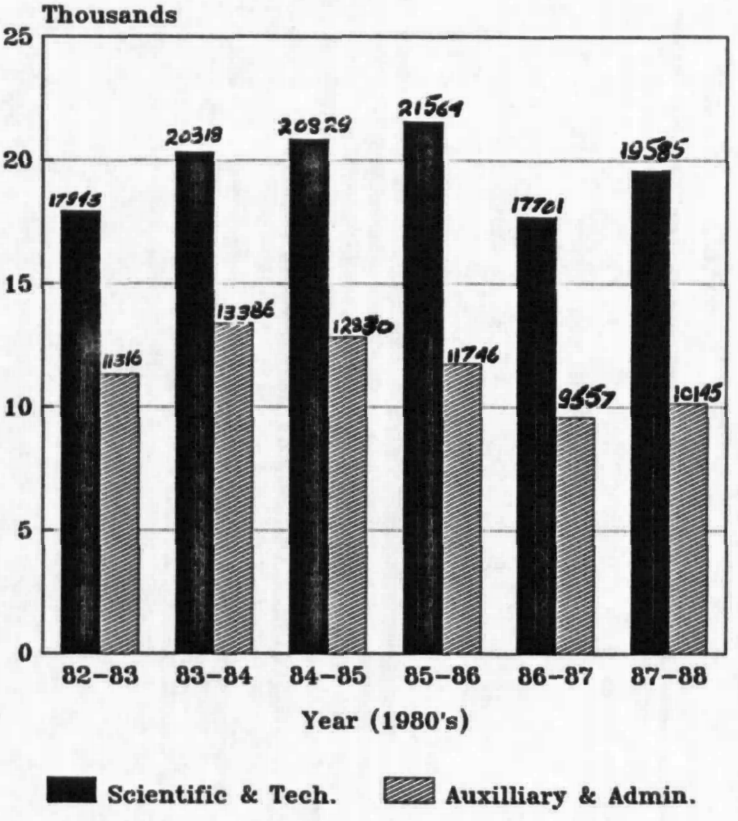
[61] *Nuclear India*, 25 (7 & 8), 1987, pp. 1-2.

[62] Raja Ramanna, pp. 1290-95.

[63] ibid.

Figure – III INDIA'S NUCLEAR PROGRAMME

GROWTH OF MANPOWER



SOURCE: NUCLEAR INDIA 23 (7 & 8),1985, 24 (5 & 6),1986, 25 (7),1987, 26 (1 & 2) 1988.

NUCLEAR POWER PROFILE (1985-2000 AD): A 15 YEARS NUCLEAR PROGRAMME FOR INDIA:

In 1983, the DAE carried out a detailed study of the Indian nuclear programme and up-dated its targets. The study titled, Nuclear Power Profile: A 15 Years Nuclear Programme for India, determined that a total installed capacity of 10, 000 MWe through atomic energy was feasible by the end of the century.[64] To achieve that objective, it envisaged installation of 12 standard PHW reactors of 235 MWe (gross) output capacity and 10 larger size (500 MWe) output capacity nuclear reactors.[65] In addition to nuclear power generation, it sought augmentation of nuclear facilities and technological development in most fields of atomic energy. It stipulated an addition of 600 scientists, raising the technical manpower up to 29,000 by end of the current century, expansion of reprocessing facilities, and increasing heavy-water production up to 1530 tons per year.[66] The capital cost of this new plan has been estimated about Rs. 13,940 crores for developmental expenditure and Rs. 8,300 crores for O & M (organization and management) expenditure at the 1983 price index.[67] If the target of 10,000 MWe is achieved as stipulated, it would contribute 8 to 10 per cent to the total planned electric power generation capacity in India.[68]

---

[64] Annual Report 1984-1985: Department of Atomic Energy (Bombay, GOI, 1985), p. 16; Excerpts are also available in *Nuclear India*, 23 (1), 1984, special issue, pp. 10-11 and *Nuclear India*, 23 (7 & 8), 1985. pp. 4-5.

[65] ibid.

[66] ibid.

[67] ibid. Also see a graph on the projected capital expenditure for the 10,000 MWe programme at the end of this section in figure - IV.

[68] ibid.

On the basis of previous performance of the DAE to achieve its targets in the generation of nuclear power, it appears that the new plan is as ambitious as Sarabhai (1970-1980) Profile, and its completion within the stipulated period is very doubtful. The installed power capacity of 1230 MWe in 1986 was 1470 MWe less than the 1970-1980 plan expected to achieve in 1980.[69] It seems that the DAE will be not be able to meet the target set under the current nuclear profile. However, if reviewed over a long-term perspective in the light of technological limitations and the primary objective of self-reliance, India has made reasonable progress in the development of nuclear power and technology. The basic design of its PHW reactors is Canadian in origin. India received the full blue-prints in the 1950s and 1960s when Canada was generously providing nuclear technology and financial assistance under the impression that Nehru's assurances would preclude their use for other than peaceful purpose. The very fact that a developing country like India could independently design, manufacture and install atomic power stations is commendable. No other developing country have been able to achieve such a capability. Bhabha's development strategy to opt for PHW, natural uranium reactors at the first stage and subsequent development for more advanced techniques like fast breeder test reactors proved sound, despite the delay occurred. The planning to shift the entire Indian nuclear fuel cycle to thorium, of which India has the largest known reserves, will not only be economical in future but allow it to maintain its autonomy. In addition to generating electric power, its safeguards-free nuclear power and research reactors are providing large quantities of weapon-grade plutonium. This capacity will continue to expand along with the development of the nuclear power programme.

---

[69] _Nuclear India_, 25 (7 & 8), 1987, pp. 1-2.

The fact remains that the Indian nuclear programme is far behind its schedule in terms of realizing its targets for generation of nuclear power (electric). The main reasons for not meeting the stipulated targets were the withdrawal of Canadian and the U.S. nuclear cooperation. The planning and setting up of targets was too ambitious. Administrative inefficiency and technological handicaps were also pervasive. According to 1983-84 figures, India's planned installed power capacity (nuclear) was 5 % of the total output of electricity as compared with South Korea's 6 % and by end of the current century, the gap would be much larger. India's installed nuclear power capacity (planned) would be 10 % compared with South Korea's (planned) 41 %.[70] It is noteworthy that India's nuclear industry is far larger in size than South Korea. The comparison shows that the size of a nuclear industry and financial expenditure incurred on it is not a reliable index of its efficiency or output capacity. Though no precise data is available, the actual nuclear power (electric) output capacity of India is much lower than installed or planned.

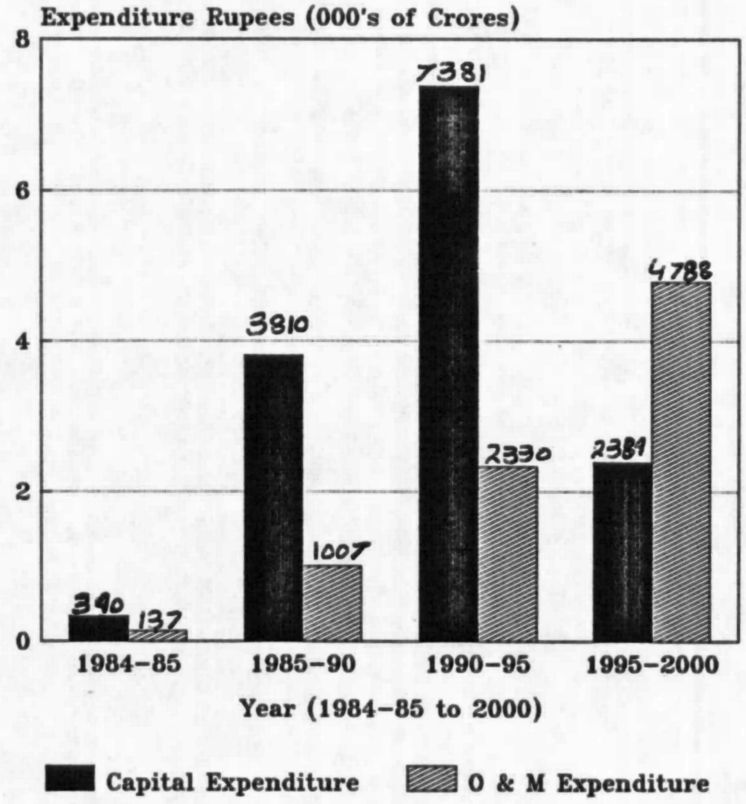
Projected capital and O & M (organization and management) expenditure for the 10,000 MWe nuclear power generation programme is given in figure-IV on the next page. The figures provided are in the Indian rupees and not translated in dollars or pounds because the programme is not effective so far due to delays, and future value of the Indian rupee cannot be worked out. At present (15 August 1991), one pound is equivalent to 43. 97 Indian rupees and one dollar is equivalent to 25. 77 rupees.[71] It is after India carried out approximately 9 % devaluation of the rupee due to an acute financial crisis. It is facing huge trade deficit at present and is extremely short of foreign exchange.

---

[70] Raja Ramanna, p. 1283.

[71] *India Today*, 15-31 August 1991, p. 113.

Figure – IV Projected capital and O & M Expenditure for the 10,000 MWe Nuclear Power Programme



SOURCE:Raja Ramanna,'A 15–Year Programme for Nuclear Power in India', STRATEGIC DIGEST, Nov. 1984, p1289.

2.c. DEVELOPMENT OF TECHNOLOGICAL INFRASTRUCTURE

The premier Indian scientific institution in the nuclear field is Bhabha Atomic Research Centre (BARC). Its responsibilities have gradually grown into a wide range of activities in R & D in nuclear technology.[72] These activities are as diverse as nuclear physics, radio-chemistry, radio-metallurgy, reactor engineering and control, fuel reprocessing, LASER applications and nuclear biology.[73] During 1975-76, BARC was reorganized into the following divisions: i) Physics Group, ii) Metallurgy Group, iii) Chemical Group, iv) Analysis Group, v) Reactor Operations and maintenance Group, vi) Isotope Group, vii) Bio-Chemical Group, viii) Electronics and Instrumentation Group, ix) Engineering Services Group, and x) Administrative Group.[74]

As noted earlier in the section (2.b.) on research reactors, India's four nuclear research reactors are located at the BARC, ASPARA, CIRUS, ZERLINA, and DHRUVA. It also has a chemical separation plant for extraction and reprocessing of plutonium from irradiated reactor fuel, with an annual capacity of 100 metric tons.[75] It has additional facilities for fuel fabrication, separation and reprocessing.

BARC has grown into one of the largest research centres in the world, with 13,000 personnel, 3,000 of whom are professional scientists and engineers engaged in R & D in nuclear technology.[76] Nuclear expertise developed at the BARC

---

[72] Annual Report 1975-76: Department of Atomic Energy, (Bombay, GOI, 1976), pp. 11-12.

[73] ibid.

[74] ibid.

[75] NUCLEAR ENERGY PROGRAM-INDIA (U), Defense Intelligence Agency, p. 17.

[76] *Nuclear India*, 25 (1), 1986, p. 2.

provided the basis for carrying out the 1974 nuclear test. According to Onkar Marwah, a team of 56 scientists from BARC directly coordinated the experiment.[77] Both the technological facilities which were employed by India for producing fissile plutonium for the 1974 nuclear test are located at BARC: CIRUS reactor and the Trombay Reprocessing Plant.[78] One of the world's largest safeguards-free research reactor, DHRUVA is also located at the BARC. According to one source, BARC is not only working on military R & D in nuclear technology but is engaged in the development of hydrogen bomb technology.[79] About 30 to 40 nuclear scientists at the BARC are working on a scientific technique known as Inertial Confinement Fusion (ICF) in which LASERS are used to achieve high compression of deuterium or tritium - the isotope of hydrogen employed in a fusion bomb.[80] The project was initiated under the supervision of Dr. P.K. Iyengar, the man who developed the trigger mechanism for the 1974 test.[81] According to a U.S. Congressional report, the BARC is one of the two facilities in India which has a major significance for the production of nuclear weapons.[82]

Another significant scientific institution which has brought India a fairly high degree of self-sufficiency is the Reactor Research Centre established at Kalpakkam for the development of indigenous technology in reactor design,

---

[77] Onkar Marwah, p. 105.

[78] Analysis of Six Issues About Nuclear Capabilities of India, Iraq, Libya and Pakistan, p. 3.

[79] 'Shadow of an Indian H-Bomb', pp. 1-2.

[80] ibid.

[81] ibid.

[82] Nuclear Proliferation in South Asia: Containing the Threat, p. 22.

construction and operation.[83] A major achievement of this centre is the designing, construction and operation of India's first Fast Breeder Test Reactor (FBTR), which is a plutonium fuelled, sodium cooled reactor.[84] The design and development of the FBTR began in early the 1970s. The French Atomic Energy Commission and various French companies provided not only R & D assistance but helped in the fabrication of major components.[85] The centre was renamed as Indira Gandhi Centre for Atomic Research (IGARC) in her honour.[86] This centre is also engaged in the development of a 500 MWe prototype fast breeder reactor.[87] It is going to be the centre of research and development on fast breeder reactors which India has planned to install in the future and fully utilize the Indian reserves of thorium. Thereby, India would realize the long-term objectives of its nuclear power planning. However, it would take a long time to achieve the objectives.

The Indian nuclear industry is gradually expanding and it might become one of the largest in the world, given its large size at present. The Indian AEC and the DAE have so many scientific installations and subsidiary bodies that it is difficult to provide a description about all of them. It is also not within the scope of this study. A map about the atomic energy establishments is provided in figure-V on the next page to provide a glimpse of its description and location.

---

[83] Annual Report 1986-87: Department of Atomic Energy, pp. 2-6.

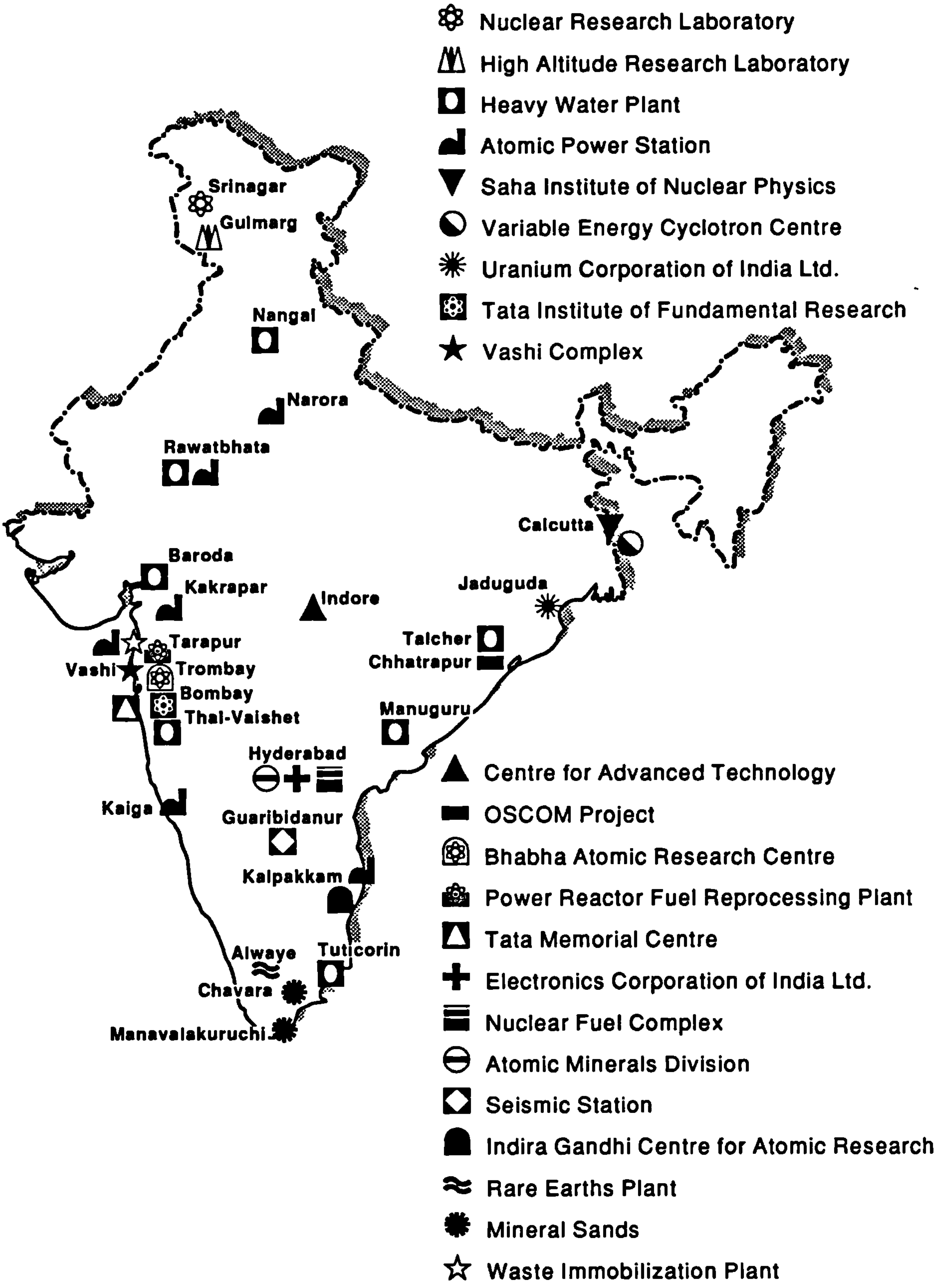
[84] ibid.

[85] Annual Report 1972-73: Department of Atomic energy (Bombay, GOI, 1973), pp. 122-24.

[86] ibid.

[87] ibid.

ATOMIC ENERGY ESTABLISHMENTS IN INDIA



Source: *Nuclear India* (24), 5 and 6, 1986

2.d. HEAVY-WATER PRODUCTION

Since India opted for pressurized heavy-water reactors in the first phase of its development strategy, large scale quantities of heavy-water became a pre-requisite to sustain the operation of these reactors. Initially (1954-60), India imported heavy-water from the U.S. and Canada under the Atoms for Peace Proposal and the Colombo Plan. The U.S. supplied 21 tons of heavy-water for the operation of CIRUS.[88] India installed its first heavy-water plant of 14 metric tons (MT) capacity per year in 1962 at Nangal in Haryana with technical assistance from two U.S. companies, Vitro Corps and National Research Corps.[89] Some equipment used in the assembly of the plant was provided by a cartel of French, Italian and West German firms.[90] Sarabhai (1970-1980) planning profile envisaged a production target of 300 to 400 metric tons of heavy-water per year.[91] Five heavy-water plants were installed in that period to achieve the target. The capacity and location of these plants is as follows:[92] i) Baroda, 45 MT; ii) Kota, 85 MT; iii) Toticurin, 49 MT; iv) Talcher, 50 MT; and v) Thal-Vaishent, 110 MT. Two more plants were planned to be installed at Manugum (185 MT) and Hazira (110 MT), raising the planned output capacity up to 650 MT approximately.

India's performance in domestic heavy-water produc-

---

[88] Don Oberdorfer, 'U.S. Training Aid in the Indian A-Blast Cited', p. A1 and "Public Hearing on the U.S. Nuclear Cooperation: India's Atomic Blast; Extent of Foreign Aid", DAWN (Karachi), 18 August 1976, p. 7.

[89] ibid.

[90] ibid.

[91] Annual Report 1973-1974: Department of Atomic Energy (Bombay, GOI, 1974), pp. 130-32.

[92] *Nuclear India*, 25 (5 & 6), 1987, p. 11.

tion was and remains dismal. Despite appropriation of large financial resources and efforts, heavy-water production is the most trouble-plagued sector of the Indian nuclear industry. Actual production has lagged far behind due to design flaws in the plants, operating difficulties and successive disasters.[93] According to a former member of the U.S. Nuclear Regulatory Commission, Professor Gary Milholin, India's public record revealed that it never produced more than 50 tons of heavy-water per year by fiscal year 1984-85 against its planned capacity of 300 to 400 tons.[94] In a statement before the Indian Parliament in 1986, the Secretary DAE, Dr. Srinivasan, admitted that the domestic heavy-water plants operated far below the planned capacity.[95] In another in-depth study of heavy-water in India carried out under the auspices of the Wisconsin Project on Nuclear Arms Control, Milholin concluded that India has obtained large quantities of heavy-water through clandestine means and uses it to run its safeguards-free nuclear reactors (MAPP I & II and DHRUVA) in an apparent violation of its international obligations.[96] The study indicated that India never produced or publicly imported enough heavy-water to run all its reactors at the same time. According to the study, India needed 1,239 tons of heavy-water to run its reactors in 1985 but had only 1,038 tons in its public records, leaving a shortage of 201 tons which was

---

[93] 'Waiting for Heavy-Water', India Today, 31 January 1982.

[94] Gary Milholin, 'Dateline New Delhi: India's Nuclear Cover-up', Foreign Policy No. 64, Fall 1986, pp. 163-64.

[95] ibid.

[96] Gary Milholin, Heavy-Water in India: A Study (Washington DC, the Wisconsin Project on Nuclear Arms Control, 28 January 1986), pp. 1-2, Unpublished.

met by secret imports.[97] Milholin contended that the clandestine imports would give India a chance to build a nuclear arsenal.[98]

Since the conclusion of Milholin's study, a number of reports have appeared which substantiate its reliability. On 3 January 1989, THE WALL STREET JOURNAL carried a detailed report about clandestine shipment of heavy-water from Oslo to Bombay via Basel (Switzerland).[99] The report stated that a West African chartered plane airlifted about 15 metric tons of heavy-water from Oslo, which according to the paperwork, was destined for Frankfurt but instead landed at Basel. At Basel another 6.6 tons of the Soviet-origin heavy-water was loaded and it was carried to Bombay.[100] The report added that the illicitly imported heavy-water was meant for use in India's three safeguards-free nuclear reactors.[101] However, noteworthy primary evidence of India's clandestine imports of heavy-water was leaked from the 1988 annual report of the Indian Comptroller and Auditor General.[102] He concluded that Indian heavy-water plants produced less than a third of the material required to operate the three safe-guards free reactors, MAPS I & II and DHRUVA.[103] This validates the reports of India's illegal imports of heavy-water to operate the three reactors

---

[97] ibid.

[98] ibid.

[99] John J. Fialka, 'Out of Control: How "Heavy-Water" Seeps Through Cracks of Nuclear Regulation', The Wall Street Journal, 3 January 1989, p. 1.

[100] ibid.

[101] ibid.

[102] 'Audit Agency Report Puts Heavy-Water Claims in Doubt', PATRIOT, 18 May 1988, reprinted in JPRS-TND 13 July 1988.

[103] ibid.

to recover safeguards-free plutonium. India was already recovering plutonium from the Tarapur reactors (TAPS I & II) and RAPS II, but that material was under safeguards. It could only be used for peaceful purposes like R & D and fuel for the FBTR. Its diversion for military use was verifiable under the IAEA safeguards. The illegal imports suggest that India needed heavy-water to operate safeguards-free reactors for recovering plutonium for possible weapons use. It could not be available from the operational reactors because of the safeguards applicable on them. (See appendix-III on heavy-water).

2.e. NUCLEAR FUELS

According to available estimates, various uranium ore reserves totalling up to 73,000 tons have been identified in India.[104] The DAE authorities believed that approximately 49,000 tons of these ore reserves contain 0.015 to 0.07 percentage of Uranium Oxide and are considered commercially exploitable.[105] As reported by the International Nuclear Fuel Cycle Evaluation (INFCE), about 30,000 tons of Indian uranium are reasonably assured for use at $ 80 per kg, while another 30,000 tons are usable at $ 130 per kg.[106] The global total of reasonably assured uranium is estimated as 1.8 million tons at an average of $ 80 per kg and an additional 2.6 million tons at $ 130 per kg.[107] Indian annual production capacity was estimated at 270 tons for 1980 and 230 tons for 1985.[108] Most

---

[104] *Nuclear India*, 23 (1), 1984, Special Issue, p. 7.

[105] ibid.

[106] Fuel and Heavy-Water Availability: Report of the Working Group 1, International Nuclear Fuel Cycle Evaluation, (Vienna, IAEA, 1980), p. 154.

[107] ibid.

[108] ibid, p. 180.

of the Indian reserves are located in Singhbhum in Bihar, Madhya Pradesh, and Karnatka. These reserves are insufficient for India's large nuclear programme and long-term requirements.

India is known to possess the largest reserves of thorium in the world which are estimated at 500,000 tons.[109] Thorium is found in the form of mineral monazite and located in Kerala, Tamil Nadu and Bihar. About 200,000 tons are located along the coast, while another 300,000 tons are located on the Ranchi Plateau (in Bihar).[110] Abundant quantities of thorium was the primary factor for which Bhabha shifted the Indian nuclear fuel cycle to U-233 (which is recovered from thorium through fast breeder reactors at the second and third stages of the development strategy). The Indian Rare Earth Limited prospects and develops these reserves into an industrially usable form. India has a Nuclear Fuel Complex at Hyderabad to fabricate nuclear fuel for its atomic reactors. At the initial stage, India sought technical assistance from U.S. firms in R & D in the field of thorium technology.[111] India is operating commercial scale reprocessing plants to acquire fissile plutonium. It has mastered the technology of breeding U-233 from the irradiation of thorium.[112] It is operating U-233 fueled research reactor PURNIMA and a fast breeder test reactor (FBTR).[113] As a result, India has established a complete nuclear fuel cycle capabi-

---

[109] NUCLEAR ENERGY PROGRAM-INDIA (U), the U.S. Defense Intelligence Agency, p. 15.

[110] ibid.

[111] Annual Report 1960-1961: Department of Atomic Energy, p. 70.

[112] Annual Report 1986-1987: Department of Atomic Energy, pp. 5-8.

[113] ibid.

lity except in certain highly sophisticated fields like thermonuclear fissile materials. However, as will be described in section 3 on weapons-grade materials, India is involved in acquiring lithium and tritium which are used in thermonuclear weapons. The completion of nuclear fuel cycle capability has enabled India to withstand international pressures to put its nuclear facilities under full-scope safeguards because it is no more dependent on external assistance in this regard. It is a commendable achievement for a developing country like India. No other country in the developing world has demonstrated such a remarkable growth in the field of nuclear fuel technologies. Even amongst the various fields of the Indian nuclear programme, this is a significant progress as compared with heavy-water production or generation of nuclear power for electricity purposes.

2.f. NUCLEAR REPROCESSING CAPABILITY

India began to establish a safeguards-free plutonium reprocessing plant in the late 1950s at Trombay and completed in 1964.[114] It was a part of Nehru's strategy to develop a nuclear weapons option. At that time, India had not installed a single power reactor except CIRUS (research-cum-power). These two facilities were used to carry out the 1974 nuclear test. The Trombay plant, which had an initial capacity of 30 tons, was refurbished to increase its reprocessing capacity up to 100 tons per year.[115] A commercial scale plant for reprocessing the plutonium recovered from power reactors, named PREFRE (Power Reactors Fuel Reprocessing) became operational in 1979 at Tarapur with a 100 tons reprocessing

---

[114] See Chapter Three, Section 2, pp. 74-81.

[115] NUCLEAR ENERGY PROGRAM-INDIA (U), the U.S. Defense Intelligence Agency, p. 17.

capacity per year.[116] It was an indigenous effort by Indian scientists and therefore, like the first reprocessing plant, it is also free from international safeguards. However, the plant is supervised by the IAEA when it undertakes reprocessing of plutonium recovered from reactors under safeguards. A third reprocessing plant, KARP (Kalpakkam Reprocessing Plant) of 125 tons capacity per year was expected to be operational in 1990-91 at Kalpakkam.[117] It is designed to reprocess plutonium recovered from MAPP I & II and FBTR, all of which are at the same site.[118] India plans to install two more large scale plants each with a capacity of 400 tons per year but their sites have not yet been earmarked.[119] (See appendix-IV for details).

3. WEAPONS-GRADE (NUCLEAR) MATERIAL

Reliable availability of weapons-grade material, either fissile plutonium or highly enriched uranium is an essential pre-requisite to embark upon a nuclear weapons programme. According to a U.N. Report, 25 of kg highly enriched uranium or 8 kg of reprocessed (fissile) plutonium is adequate to produce a 20 KT (Kiloton) nuclear bomb.[120] India has large quantities of plutonium recovered from its power and research reactors. It has reprocessing plants to transform

---

[116] *Nuclear India*, 21 (6 & 7), 1983, p. 2.

[117] *Nuclear India*, 23 (1), 1984, special Issue, p. 9; and Annual Report 1986-1987: Department of Atomic Energy, pp. 6-10.

[118] ibid.

[119] Raja Ramanna, p. 1289.

[120] The Report is cited by J.C. Hopkins, 'Nuclear Weapons Technology', in a SIPRI publication, *NUCLEAR PROLIFERATION PROBLEMS* (Stockholm, The MIT Press for SIPRI, 1974), pp. 114-116.

that plutonium into weapons-grade material free from any international safeguards. As is evident from the data collation in appendix-V, the Indian stockpile of total accumulated safeguards-free plutonium from its research and power reactors in the year 1991 is 1025 kg. These figures are likely to rise to 2445 kg in 1995, and 5570 kg in the year 2,000 AD.[121]

It is now widely known that nuclear weapons can be produced with reactor-grade plutonium without reprocessing.[122] For employing reactor-grade plutonium for weapons production, it is kept in storage for a longer period of time and about 30 per cent of it reacts automatically by absorbing an additional neutron and produces fissile plutonium (Pu-240).[123] According to an assessment in the SIPRI YEARBOOK 1972, reactor-grade plutonium can be used for 'primitive but still effective nuclear weapons'.[124] However, larger quantities of reactor-grade plutonium is required to achieve the required explosive yield and the weapon's size becomes too large in this case.

Indian nuclear reprocessing technology is too advanced and large to rely on such primitive techniques. As stated above, India is already operating two reprocessing plants, each with an output capacity of 100 metric tons per year (Trombay and PREFRE). With these reprocessing plants in operation, India has no problem in converting large quantities of plutonium into weapons-grade material. As noted earlier, India has been converting safe-guards free plutonium recovered from MAPP I & II into fissile material since 1986-

---

[121] See appendix-V. The plutonium recovered from CIRUS is not included in the data collation in this appendix.

[122] J.K. Miettinen, 'Nuclear Mini-weapons and Low-Yield Nuclear Weapons', *NUCLEAR PROLIFERATION PROBLEMS*, pp. 123-24.

[123] ibid.

[124] SIPRI, *WORLD ARMAMENTS AND DISARMAMENT*: SIPRI YEARBOOK 1972 (Stockholm, SIPRI, 1973), p. 366.

87.[125] Including DHRUVA, these three facilities provide India enough plutonium for a sizeable nuclear force.[126]

India also has large stockpiles of plutonium available from its power reactors which are under safeguards like TAPS I & II and RAPS I & II. Each of the four reactors have 60 kg plutonium production capacity per year. That plutonium is reprocessed under international safeguards and used for civilian requirements, like R & D and fuel for the FBTR. That leaves India free to devote its safeguards-free plutonium for weapons use. According to the INFCE report, India was expected to possess 7.25 metric tons of plutonium by 1990 and up to 36.49 metric tons by the year 2,000 [127] However, it needs to be pointed out that these are elusive figure because the report does not differentiate between the material which is safeguards-free and which is under safe-guards. It is therefore, not an adequate assessment of the material India could divert to weapons use.

It is noteworthy that various assessments of the fissile plutonium available to India for potential weapons use differ and at times the discrepancy is significant. The 1988 Carnegie Report estimates that India would have enough material for more than 100 Hiroshima size nuclear weapons by the end of 1991.[128] On the other hand, an Indian analyst opined that India would not be able to successfully produce even a minimum deterrent force within a period of five to ten years.[129] However, this study is now outdated because more

---

[125] NUCLEAR WEAPONS AND SOUTH ASIAN SECURITY, p. 9.

[126] See appendix-VI for number of nuclear weapons which India can produce.

[127] INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION: Report of the Working Group 1, 198.

[128] NUCLEAR WEAPONS AND SOUTH ASIAN SECURITY, p. 2.

[129] Gupta, pp. 10-13.

Indian power and research reactors have become operational since its publication. They are safeguards-free and add to its nuclear weapons capability. According to another estimate by the NUCLEONICS WEEK, India would be able to produce around 600 kg of safeguards-free Plutonium annually by the early 1990s which it considers enough for 100 nuclear weapons per year.[130] This source is generally reliable but it is difficult to assess the authenticity of the estimate because it does not provide the criteria on which the annual plutonium production capacity is worked out. However, notwithstanding the variations of estimates, it can be argued that India possesses large stockpiles of safeguards-free plutonium and the quantity is rapidly expanding as more power reactors are becoming operational. Current stocks would enable India to manufacture about 128 nuclear warheads (8 kg size), or 102 (10 size kg) or about 51 (20 Kg size) by 1991.[131] It would rise to 305 warheads (8 kg size), or 244 (10 kg size), or 122 (20 kg size) by 1995, and further expand to 696 (8 kg size), or 557 (10 kg size) or 278 (20 kg size) by the year 2000 AD.[132]

This capability may be significantly enhanced after the expiry of the Indo-U.S. agreement in 1993 on the Tarapur Reactors if the Indo-U.S. controversy over safeguards issue is not resolved. India contends that the application of safeguards after 1993 on the material recovered between 1969 to 1985 from TAPS I & II reactors should lapse. According to Milholin, India, by an 'implausible and stubborn reading of the expiration clause of the Tarapur Agreement' contends that after 1993 the two reactors and all the plutonium in their

---

[130] Nucleonics Week, 15 August 1985, p. 1.

[131] See appendices V and VI.

[132] ibid.

spent fuel will be 'free for use in the bombs'.[133] Milholin estimated that it would provide India about 1800 kg of safeguards-free plutonium which will be enough for 225 atomic bombs (8 kg size).[134] Paradoxically, Milholin believes that if the international controls were used vigorously and in league with India's other suppliers, its nuclear programme could be restricted to peaceful purposes. This belief appears an unrealistic optimism because India has other safeguards-free reactors which provide it enough fissile material for a modest nuclear weapons capability. In fact, in view of the existing stockpile of safeguards-free plutonium, it is very unlikely that India would need to use the plutonium recovered from Tarapur reactors for weapons purposes.

According to a recent report, India is also engaged in the acquisition of material for thermonuclear weapons technology. Quoting a U.S. administration source, it stated that, Degussa AG, a major West German chemical company, illegally exported two shipments of beryllium to India.[135] Beryllium is used for the production of lithium or tritium for use in thermonuclear weapons and to enhance the yield of nuclear weapons. The West German company purchased the material (beryllium) from the U.S. on the condition that it would obtain prior U.S. permission to export the material outside Germany [136] During the investigations, Degussa AG acknowledged both shipments of beryllium to India, totalling 209

---

[133] Gary Milholin, 'Stopping the Indian Bomb', *American Journal of International Law*, July 1987, pp. 594-610. Full details of the Indo-U.S. controversy are available in this article.

[134] *ibid*.

[135] INTERNATIONAL HERALD TRIBUNE, 1 February 1989.

[136] *ibid*.

pounds.[137] According to the West German official sources, 'the material which enhances nuclear bombs by halving the amount of plutonium needed in their production, was sent to India's Bhabha research center, the country's chief research facility for nuclear weapons'.[138] It further demonstrates India's interest in nuclear and thermonuclear weapons material.

4. NUCLEAR WEAPONS TECHNOLOGY

Another essential pre-requisite for a nuclear weapons capability is the development of technology to design and fabricate nuclear weapons. Before focussing on India's capability, it is relevant to note three terms which are often used interchangeably but denote different meanings: a nuclear device, nuclear explosive, and nuclear weapon. A nuclear device is an assembly of parts and equipment which could be set up at a test site for an experiment and may or may not be reliably transportable, or until tested, predictable in performance or explosive yield.[139] A nuclear explosive is more sophisticated and portable, but still requires time to assemble and prepare for detonation, like the "Peaceful Nuclear Explosion" (PNEs) developed by the U.S. and the Soviet Union in the 1960s.[140] The superpowers demonstrated considerable interest in exploring the efficacy of PNEs for subsoil engineering and underground construction operations. Two categories of PNEs were experimented at that time, excavation

---

[137] Thomas F. O'Boyle, 'West German Export Controversy Grows With Confirmation of Shipments to India', The Wall Street Journal, 1 February 1989.

[138] ibid.

[139] Analysis of Six Issues About Nuclear Capabilities of India, Iraq, Libya and Pakistan, p. 34.

[140] ibid.

explosions and contained explosions.[141] Excavation explosions were experimented for earth moving operations, like construction of canals and reservoirs, diversion of rivers and uncovering of mineral deposits from under the upperstrata of the earth.[142] Contained explosions were tried for deep underground engineering experiments for R & D purposes.[143] However, the practical utility of a PNE of either category has never been established and there are many unanswered questions about their dangers to health and environmental conditions.[144]

A nuclear Weapon implies further refinement in design and fabrication to produce a reliable or predictable bomb capable of being delivered by an adequate delivery system.[145] It is a weapon on which a head of a government or military commander could rely upon. The first U.S. test at Alamogordo in July 1945 was a nuclear explosive, while the bombs dropped at Hiroshima and Nagasaki were crude nuclear weapons.[146] Although it is possible nowadays to develop first generation of nuclear weapons without testing, a test is usually considered an assurance of their reliability. However, with the increasing sophistication of technology, it is becoming possible for a country to either simply avoid testing nuclear weapons or adopt computer simulation techniques for testing its reliability.[147] Computer simulation techniques are consi-

---

[141] IAEA, A SHORT HISTORY OF NON-PROLIFERATION (Vienna, International Atomic Energy Agency, 1976), pp. 25-27.

[142] ibid.

[143] ibid.

[144] ibid.

[145] Analysis of Six Issues About Nuclear Capabilities of India, Iraq, Libya and Pakistan, pp. 34-35.

[146] ibid.

[147] K.C. Hopkins, 'Nuclear Weapons Technology', pp. 114-120.

dered an acceptable substitute for field testing of nuclear weapons for states who want to avoid unfavourable international reactions. Israel is reported to have undertaken computer simulation tests for the development of nuclear weapons.[148]

Nuclear weapons technology is well within the competence of Indian nuclear scientists. India's nuclear test in 1974 demonstrated that its capability to design and fabricate nuclear devices was beyond doubt. According to the official Indian report, 'the successful underground nuclear experiment' at Pokharan in Rajasthan on 18 May 1974 was conducted as a part of the DAE's efforts to find ways of using underground explosions for construction purposes.[149] However, subsequent evidence suggests that the 1974 nuclear test was neither based upon the excavation nor contained explosions' techniques. As noted in Chapter Four, the 1974 Indian nuclear test was based upon the implosion technique which is more suitable for experimenting a weapon test.[150] It had military-oriented features and its triggering package had a weapons significance. According to Marwah, the policy at the technical level (labelling the test a PNE) was 'calculated to present a routine facade'.[151] Notwithstanding the difference between the two types of techniques, the 1974 test provided India the technology to fabricate reliable nuclear devices. Since then, it has continued research and development on the nuclear weapons technology With such an experience, India would have no problem at all in producing the nuclear warheads.

---

[148] Quester, *The Politics of Nuclear Proliferation*, pp. 100-101.

[149] Annual Report 1974-1975: Department of Atomic Energy (Bombay, GOI, 1975), p. 7.

[150] See Chapter Four, section 5. a, p. 153.

[151] Marwah, p. 105.

5. NUCLEAR DELIVERY SYSTEMS

The development of a credible nuclear deterrent requires adequate delivery systems, reliable modes of command, control and communication (C^3), and explicit strategies governing their deployment or actual employment in crisis-situations. Conventional military capabilities in the field of surveillance, reconnaissance and guidance for target acquisition have some preliminary utility to provide a support infrastructure for nuclear delivery systems. They need to be specifically adapted to nuclear delivery missions if a country opts for a credible nuclear deterrent. It is easier to modify an aircraft for the development of a nuclear force as compared with the adaptation of conventional missiles for carrying nuclear warheads and developing accurate guidance system. Ballistic missile systems are more difficult because their technology is complex and beyond the means of most developing countries. Therefore, a state which aspires to develop nuclear deterrent might first opt for an aircraft-based delivery system and only later develop a missile-based nuclear force. However, much depends on the state of technological development of a country that intends to develop nuclear delivery systems, the availability of scientific expertise, and the nature of threats to its security. India's case is unique in the sense that it has demonstrated a priority for long-term planning and development of technologies which have a civilian or a conventional military use but can also be employed for nuclear military purposes. This appears to be a deliberate policy choice rather than a logical sequence of its technological development. It has a range of advanced military aircraft for conventional roles, but which can be adapted to nuclear missions. It has developed missile technologies for conventional military purposes which can be used for the development of a missile-based nuclear force.

5.a. AIRCRAFT-BASED DELIVERY SYSTEM

Indian interest in a nuclear-capable aircraft coincided with its 1974 nuclear test.[152] Indian Air Force is equipped with the latest versions of high-performance and multiple-role aircraft. It can adapt any of its aircraft amongst the MIG-27, MiG-29, Jaguars and Mirage-2000.[153] At present, it has 5 squadrons with 80 Jaguars, 5 squadrons with 80 MiG-27, 3 squadrons with 50 MIGs-29 and 3 squadrons with 46 Mirage 2000.[154] The MiG-27 is a versatile, high-performance bomber with a combat radius of 600 miles and suitable for targets all over Pakistan.[155] A more obvious choice could be the Anglo-French Jaguar because of its high-speed, low-flight and deep-penetration capabilities with a combat radius of 650 miles. India had about 80 of these aircraft by 1990.[156] None of the strategic installations in Pakistan would be beyond the strike capability of Jaguar aircraft. Although these aircraft have a long combat radius suitable enough against Pakistan, their range can be further extended through additional fuel tanks so long as India cannot develop a mid-air refuelling capability. The IAF is also equipped with two squadrons of MIG-25 Foxbat, high altitude reconnaissance aircraft which demonstrates its interest in strategic surveillance.[157] Any suitable combination from this wide range of aircraft can be selected for surveillance, interception and bombing missions

---

[152] David Van Praegh, 'India's Nuclear Delivery system', *Asian Affairs*, July-August 1974, pp. 360-64.

[153] MILITARY BALANCE 1990-91 (London, International Institute for Strategic Studies, 1991), p. 162.

[154] ibid.

[155] MILITARY BALANCE 1986-1987, p. 155.

[156] See note 153.

[157] MILITARY BALANCE 1986-1987, p. 155.

for an adequate nuclear delivery system, after necessary modifications.[158]

However, reliability of aircraft-based delivery systems for a credible nuclear deterrent remains questionable. Aircraft no matter how sophisticated, are vulnerable to high precision anti-aircraft missile systems from the ground and air. Indian air defence system is not impregnable against aircraft like F-16 which Pakistan possesses. In addition, Pakistan Air Force is equipped with superior missile systems of Western origin like the U.S. Sidewinder (air-to-air), French Crotail (surface-to-air) and exocet (air-to-surface) as compared with the Soviet systems which India has acquired.[159] Notwithstanding India's overall military superiority, an aircraft-based nuclear delivery system would be vulnerable to the superior interception capability of Pakistan Air Force. The efficacy of Indian aircraft-based nuclear delivery system against China is more doubtful because many Chinese strategic installations are far beyond the combat radius of Indian Air Force. It is not equipped with a long-range strategic bombers which could engage targets deep in China. Therefore, an aircraft-based nuclear delivery system against China is more vulnerable than Pakistan. See appendix-VII for precise data.

5.b. MISSILE-BASED DELIVERY SYSTEM

India is the leading Third World country with a highly developed space programme which has enabled it to develop an IRBM capability. Compared with its nuclear programme, the Indian Space programme started late, but made steady progress in the 1970s and 1980s. Initial Work on the

---

[158] See appendix-VII.

[159] MILITARY BALANCE 1988-89 and 1989-1990, pp. 154-155 & 161-162.

development of space technology was carried out through the Space Science and Technology Centre (SSTC) and the Indian Space research Organization (ISRO). The stated objectives of India's space programme are peaceful uses of various space technologies, their development, and the achievement of national self-reliance in this field.[160]

A full-fledged space research and development programme was initiated by the DAE under the supervision of Dr. Sarabhai within the framework of a ten years joint planning profile (1970-1980). Its technological objectives were as follows:[161] i) provision of facilities for research and development at the Space Science and Technology Centre (SSTC) for building scientific and communication satellites; ii) to create facilities for the development of inertial guidance systems and on-board miniature computers; iii) construction of high performance missile tracking radars and communication systems at Shar and Andamans for the satellite programmes; iv) construction of large solid propellant blocks and facilities for their testing on ground and high-altitude simulated conditions; v) completion of rocket fabrication facilities at Trivandrum; vi) development of a Scout-type propellant by 1973-74, capable of putting into orbit a satellite of about 40 kg payload and to be followed by more advanced rocket systems capable of putting into orbit 1200 kg payload; vii) fabrication of communication satellites by 1975; and, viii) development of in-flight guidance systems, sensors and remote-sensing techniques and capabilities. India allocated Rs. 105 crores for its space programme as an initial investment.[162]

---

[160] Atomic Energy and Space Research: A Profile for the Decade 1970-1980, (New Delhi, GOI, 1970).

[161] ibid.

[162] Annual Report 1970-1971: Department of Atomic Energy, p. 159.

In 1972, an independent Space Commission and Department of Space were set up. Indian Space Commission was assigned the responsibility for policy formulation, whereas the Department of Space took over executive responsibility to administer the space programme through its various subsidiary organizations like the SSTC and ISRO. In 1973, ISRO started work on satellite launch vehicles.[163] However, it did not wait to launch satellites until India developed its own launch vehicles and placed two satellites into orbit from the Soviet launch vehicles.[164] The objective seems to be the simultaneous development in both fields rather than to delay satellite development until launch vehicles were developed. The first Indian satellite, Aryabhata, weighing 360 kg, was launched in April 1975 from a Soviet rocket. The second, Bhaskara, weighing 444 kg, was launched from the Soviet Intercosmos spacecraft.[165] Since then, India has launched a series of satellites from facilities in the Soviet Union, the U.S. and the European Space Agency.

India's first experiment to launch a satellite with its own satellite launch vehicle (SLV) on 10 August 1979 from a site at Sriharikota in Andhra Pradesh, proved unsuccessful.[166] The second attempt succeeded on 18 July 1980 and placed a satellite, Rohini-I, weighing 35 kg, into a low orbit.[167] India became the seventh nation to achieve a satellite

---

[163] David Velupillai, 'ISRO: India's Ambitious Space Agency', *Flight International*, 28 June 1980, pp. 1466-70.

[164] Ragu G.C. Thomas, 'India's Nuclear and Space programs: Defense or Development?', pp. 335-36.

[165] ibid.

[166] MISSILE PROLIFERATION: SURVEY OF EMERGING MISSILE FORCES (Washington DC, Congressional Research Service, 1988), p. CRS-72.

[167] ibid.

launching capability, other six are: the Soviet Union, the United States, France, Japan, China and Britain. On 31 May 1981, India carried out its third (SLV-3) successful experiment by placing a satellite (Rohini-II) into orbit.[168] On 17 April 1983, it carried out another successful experiment of SLV-3 by launching into orbit a 42 kg satellite. India is using a building-block approach to develop launch vehicles.[169] SLV-3 is the core of the ASLV (Augmented Satellite Launch Vehicle) programme, and the ASLV will serve as the core of the PSLV (Polar Satellite Launch Vehicle) programme.[170] Upgraded technologies are being progressively added to the next and tested with each successive step.[171] The ASLV will test the operation of strap-on-booster technology and locally developed guidance system for feeding data on spatial positions and velocities into an on-board computer which creates steering commands for the vehicle.[172] ASLV weighs 40 tons and is designed to lift a 150 kg payload into a 240 miles (400 km) high circular orbit. So far two attempts to launch the ASLV proved abortive, first on 24 March 1987 and the second on 13 July 1988.[173]

ASLV is a forerunner to the next launch vehicle, PSLV, which is being designed to undergo four launches between

---

[168] ibid.

[169] Defense Estimative Brief No. SDEB 69-86, the United States Defense Intelligence Agency, dated November 1986, p. 2. (Washington Dc, Files of the National Security Archives, 1989).

[170] ibid.

[171] ibid.

[172] MISSILE PROLIFERATION: SURVEY OF EMERGING MISSILE FORCES, p. CRS-73.

[173] ibid.

1990 to 1994.[174] However, it has not yet been tested. PSLV is designed to have two solid and two liquid propellant stages along with the six SLV-3 rocket boosters. According to Indian sources, its second stage has been test-fired successfully.[175] Planning is also underway for the successor to the PSLV, which is known as GSLV (Geostationary Satellite Launch Vehicle). It will be used to place satellites into geostationary orbit at approximately 22,000 miles (36,000 km) above the equator.[176] To be launched in the late 1990s, the GSLV will place into orbit a payload of 5,500 pounds (2,500 kg).[177] The GSLV is considered to have the range of an ICBM once it has been successfully test-fired.

5.c. CONVENTIONAL AND BALLISTIC MISSILE CAPABILITY

India has initiated an Integrated Guided Missile Development Programme (IGMDP) since the early 1980s.[178] There are five categories: two ballistic and three conventional missiles under various stages of development; i) a short-range surface to surface ballistic missile, Prithvi (earth), ii) an intermediate-range ballistic missile, Agni (fire), iii) a short range SAM, Trishul (arrow), iv) a long-range SAM, Akash (sky), and v) anti-tank missile, Nag (cobra). India has spent $ 300 million on its missile research and development program-

---

[174] ibid.

[175] 'Launch Vehicle Engine Tested Successfully', TIMES OF INDIA (Bombay), 3 November 1987.

[176] Jerrold F. Elkin and Brian Fredericks, 'Military Implications of India's Space Program', *Air University Review*, May-June 1983, p. 58.

[177] ibid.

[178] MISSILE PROLIFERATION: SURVEY OF EMERGING MISSILE FORCES, p. CRS-70-73.

me in the 1980s.[179] However, it was the SLV-3 which laid the foundation of India's sophisticated ballistic missile capability.

India successfully test-fired its first ballistic missile, Prithvi, on 25 February 1988.[180] An official Indian spokesman claimed after the test that the missile was fired up to 93 miles, but its range could be extended much beyond that limit and it was highly accurate.[181] Subsequent reports suggest that the missile is capable of carrying 2,200 pounds payload (1,000 kg), and its range has been extended up to 150-200 miles with the provision for further extension if the payload could be reduced.[182] It is a supersonic missile with single a stage rocket and inertial guidance system which includes an on-board computer to monitor its flight course and direct it to the target. It is small in size (one meter in diameter and seven meters long), mobile and potentially capable of carrying both types of warheads, nuclear and conventional.[183] A report in THE INDEPENDENT suggested that India has developed a nuclear warhead for use on the surface to surface missile with a range of 200 miles.[184] Although the report does not name the missile as Prithvi, there is no other missile of this capability which India is known to have developed. The report has not been confirmed by any other

---

[179] 'India Poised to Test-Fire Missile', THE TIMES (London), 19 April 1989.

[180] 'India Succeeds in Missile Test Launching', WASHINGTON POST, 26 February 1988.

[181] 'Shooting Ahead', *Indian Today*, 31 March, 1988, p. 96.

[182] MISSILE PROLIFERATION: SURVEY OF EMERGING MISSILE FORCES, p. CRS-71-72.

[183] ibid.

[184] 'India"has nuclear arsenal"', THE INDEPENDENT, 22 March 1988.

source. The Indian government dismissed the report as a "figment of imagination".[185] A Defence Ministry source stated that the Indian Army has placed large orders for the missile and it is likely to begin deployment in 1990-91.[186] It is extremely suitable against targets in Pakistan. India has recently carried out another test (fifth) of Prithvi on 7 August 1991.[187] Indian Defence Minister, Sharad Pawar, told press reporters that the test was successful and Prithvi's technology matched with some of the most advanced missiles of its class.[188]

On 22 May 1989, India successful test-fired an intermediate-range ballistic missile, Agni (fire), after two initial failures. Launched from Chandipur in Orissa into the Bay of Bengal, it achieved a range of 1500 miles (2,500 km) and 2,000 pounds (around 9,000 kg) payload capacity.[189] Agni has a twin microprocessor-based missile guidance system. After the test, an Indian official source described the missile as a "technology demonstrator".[190] The late P.M. Rajiv Gandhi claimed, "Agni is an R & D vehicle, not a weapon system", but went on to qualify, "Agni is not a nuclear weapon system".[191]

---

[185] ibid.

[186] 'Indian Prithvi and Trishul Deployment "within two Years", *Defense and Foreign Affairs*, 17-23 April 1989. The MOD source is referred as highly placed.

[187] 'India test-fires ballistic missile', THE NATION (Lahore-Pakistan), 8 August, 1991.

[188] ibid.

[189] 'India Tests Mid-Range "Agni",' WASHINGTON POST, 23 May 1989, p. A1.

[190] 'Indian missile launch prompts nuclear fears', THE INDEPENDENT, 23 May 1989.

[191] Gary Milholin, 'India's Missiles- With A Little Help From Our Friends,' *The Bulletin of Atomic Scientists*, November 1989, pp. 31-35.

Afterwards, he added, "What Agni does is to afford us the option of developing the ability to deliver non-nuclear weapons with high precision at long ranges".[192] Although India claims that Agni is a purely conventional military system, its authenticity is dismissed by a wide range of international opinions. A report published by THE TIMES a month before the test stated that Agni was being developed with an option to carry a nuclear warhead.[193] After the test, it again reported that Agni is capable of carrying nuclear weapons after adaptation.[194] A Carnegie study also concluded that, 'the missile's substantial payload would enable it to carry nuclear warhead easily'.[195]

Agni is a copy of the U.S. Scout, with a design and technological data similar to that. Agni's architect, Dr. Abdul Kalam, received four months training in 1963-64 at NASA's Langley Research Centre in Virginia (where the U.S Scout rocket was designed) and the Wallops Island Flight centre on the Virginia coast (where the Scout was flight-tested).[196] In 1965, Indian government sought NASA's assistance to develop the Indian version of scout and obtained technical reports on its design and development.[197] In 1987, NASA's Office of Munitions Control sought commodity jurisdiction from the State Department to export rail clamps, wheels

---

[192] ibid.

[193] 'India Poised to Test-Fire Missile', THE TIMES (London), 19 April 1989.

[194] 'Gandhi denies nuclear application as India launches ballistic missile', THE TIMES, 23 May 1989.

[195] Spector with Smith, p. 74.

[196] Milholin, p. 32. Milholin's study is based upon the documentary evidence, like the exchange of letters between NASA and the Indian AEC.

[197] ibid.

and truck assemblies for use in a mobile service tower at Shar Space Research Centre in India.[198] Although the commodities under discussion were to be provided for only civilian use, NASA knew that the end use of this hardware could contribute to the development and launch of ballistic missiles.[199] Milholin's observation in this regard is noteworthy:

> The story of the development of India's first strategic missile shows how difficult it is to separate civilian and military uses of technology, and how futile may be the recent attempts to stop the spread of missiles'.[200]

Once it becomes operational, Agni's 2,500 km range (IRBM) would enable it to engage targets as far in China as Beijing and Canton if deployed in the Eastern parts of India. If deployed in the north-east, it is capable of engaging targets deep in central China. From North-western India, it can reach a wide range of targets in southern China. It also would have utility against targets in the western parts of Pakistan near the Iranian border. The range of the missile would also enable India to engage targets as far as Turkey in the West and Indonesia in the East. Therefore, its implications go far beyond the immediate vicinity of the South Asian region. There is no precise information whether Agni is being produced at this stage, but given the urgency attached to the development of ballistic missiles by the Indian government, it is likely to go in production in the near future. India can convert its launch vehicles into ballistic missile in a relatively short period, given the time and commitment. If India succeeds in keeping the scheduled progress of its future

---

[198] Memorandum from Acting Chief, International Program Support Office, NASA to the Department of State, NASA, commodity case CJ 009-87 dated 19 February 1987.(Washington Dc, Files of the National Security Archives, 1989).

[199] ibid.

[200] Milholin, p. 31.

space projects, like the ASLV, PSLV and GSLV, it might achieve an ICBM capability by the end of this century. However, if the current delays persist, it might not be possible within the above time frame. (See appendix-VIII on India's ballistic missiles capability).

To conclude, it is argued that no Indian government has ever acknowledged the initiation or existence of a nuclear weapons programme. However, with the continual growth of a sizeable nuclear weapons capability, the gap between evident military form of India's nuclear programme and the official denials about its existence has become much wider. It therefore, highlights the underlying contradictions. India's denials that it has never initiated a nuclear weapons programme appear more diplomatic than real in the light of its capability. As noted in the previous chapter, India deliberately fosters ambiguity about its nuclear weapons capability for certain perceived advantages. A rapidly increasing volume of evidence substantiates that India is developing nuclear weapons. Press reports citing U.S. officials and intelligence sources disclosed that India has been producing nuclear weapons since late 1986.[201] In March 1988, THE INDEPENDENT, citing U.S. National Security Council officials, reported that, 'India has built several highly sophisticated low-yield atomic bombs, which could be used with combat aircraft'.[202] In April 1989, another report disclosed an official source from close to the late P. M. Rajiv Gandhi that India could produce a nuclear bomb "overnight".[203] It pointed out that 'India has

[201] Richard Sale, "India Said to Be Building 20 Nuclear Weapons a Year ", United Press International, 25 April 1988 PM Cycle), in Spector, *THE UNDECLARED BOMB*, p. 106.

[202] "India has nuclear arsenal", THE INDEPENDENT, 22 March 1988.

[203] WEEKLY TIME MAGAZINE, 3 April 1989, p. 16.

nuclear-weapons components on the shelf and a special team ready to assemble them.'[204]

The evidence about India's development of nuclear weapons is gradually increasing. In May 1989, the Director of CIA, Mr. William Webster, disclosed to the U.S Senate Committee on Government Operations that there were 'several indicators' about India's development of enhanced nuclear and thermonuclear weapons.[205] He told the Committee that India is working on the separation and purification of lithium-6, which can either be used in thermonuclear weapons or in the production of tritium to enhance the yield of nuclear weapons.[206] Webster's testimony confirmed the previously available evidence about India's involvement in developing nuclear weapons. In June 1989, David Albright and Tom Zamora concluded that the nuclear weapons programmes in India and Pakistan were far more advanced that suspected.[207] In November a former Indian Chief of Army Staff, General (retd.) K. Sundarji stated, 'The Indian citizen has every right to expect that India, having mastered the technology in 1974, is in the year of grace, 1990', and 'he would expect India, very short order, to have usable nuclear weapons also, if required'.[208] Given the fact that General Sundarji was the Chief of Staff of

---

[204] ibid.

[205] NEW YORK TIMES, 19 May 1989, p. A7 and WASHINGTON POST, 19 May 1989, p. A29.

[206] ibid.

[207] David Albright and Tom Zamora, 'India, Pakistan's nuclear weapons: all the pieces in place', *Bulletin of the Atomic Scientists*, June 1989, pp. 20-26. To assess the respective capabilities of India and Pakistan, Albright relies on his interviews with the former designer of U.S. nuclear weapons, Theodore Taylor.

[208] General K. Sundarji, 'The Nuclear Threat' *India Today*, 30 November, 1990, p. 94.

Indian Army in 1986-87, the period when first reports of India's development of nuclear weapons components began to come out, his assertions cannot be easily ruled out. Recently, a Carnegie study suggested that India has produced a limited number of nuclear weapons based upon an aircraft delivery system and likely to deploy an IRBM capability in the immediate future.[209] It further indicated that the Indian nuclear force would consist of 40 to 60 weapons deliverable by aircraft.[210]

Whether India has actually integrated nuclear weapons into its armed forces at this stage is not known. There is no public evidence as yet to identify the support mechanism for their immediate assembly in crisis situations, deployment strategy or target acquisition alternatives. All this requires elaborate procedures, and a command, control and communication infrastructure (C^3) which may not escape international scrutiny in an era of satellite reconnaissance. On the other hand, it is also difficult to dismiss the possibility that, given its oft-repeated fears of a Pakistani nuclear bomb and the intensity of hostile relationship between the two, India would not have taken necessary measures to cope with an extreme eventuality. A retired Indian Army General indicated the *modus operandi* governing the formulation of Indian nuclear strategy when he stated,

> India has developed a large-calibre gun, a medium range missile, and satellite launching capabilities. India has conducted a nuclear explosion and can, therefore, secretly fabricate a nuclear warhead for use in the missile or gun. India may opt for a "last-wire" strategy in which it secretly manufactures nuclear weapons and ____ should an aggressor threaten India ____ it can connect the last wire and

[209] Spector with Smith, pp. 78-79.

[210] ibid.

> can have a nuclear deterrent ready for use.[211]

Similarly, discussing the possible development of a small nuclear force (SNF) by India, Thomas Blau rejects the validity of Indian denials by saying:

> While Indian declaratory policy denies plans for a SNF, all the ingredients for such a force have been acquired, and the means for strategic refinements of a SNF are prefigured in India's space and high-technology development programs.[212]

The available evidence and a large body of opinions substantiates that Indian nuclear strategy is based upon the secret development of various elements of a limited nuclear deterrent, with pre-designated modes for their immediate deployment in a conflict-situation. At present, it has an aircraft-based delivery system currently available. It might add a ballistic missile (IRBM) nuclear delivery system to that capability in the near future. It has a choice of opting for a short-range ballistic missile system, Prithvi, which has undergone many successful tests and would therefore, be reliable. It can later add an IRBM capability based on Agni which has also been tested. If both the systems are gradually inducted, it would provide credibility to an Indian nuclear deterrent. However, India may not integrate nuclear weapons into its armed forces until it develops a strategic triad similar to the models developed by the superpowers unless forced to make an earlier decision.

---

[211] LT. General Eric A. Vas, 'Pakistan's Security Futures,' in Stephen P. Cohen, *The Security of Southern Asia: American and Asian perspectives* (Urbana, University of Illinois Press, 1987), p. 95.

[212] Thomas Blau, 'Small Nuclear forces in South Asia,' in Rodney W. Jones, *Small Nuclear Forces and U.S. Security Policy* (Lexington, Lexington Books, 1984), p. 99.

Chapter Eight

CONCLUSION

A study of India's nuclear strategy suggests that there has been a coherent and continuous strategic rationale in its development of a nuclear weapons capability. It is inspired by a political perspective based upon security, aspirations for regional leadership and a great-power role. Indian nuclear weapons capability was designed within the civilian nuclear power programme through a three stage development strategy formulated by Dr. Bhabha in 1954.[1] The development strategy took into account its automatic expansion along the growth of the civilian nuclear programme. India pursued a policy of ambiguity regarding the employment of atomic energy for peaceful versus military purposes. It claimed that the Indian nuclear programme was meant for exclusively peaceful uses, but denied verification of that claim by rejecting the application of international safeguards as discriminatory. Prime Minister Nehru was the architect of India's doctrine of nuclear ambiguity and his successors continued to advance the weapons capability within the ambit of ambiguity.

There was no basis for Nehru's claim that the Indian policies were based upon political and moral superiority as compared with, what he called the military line of thinking of the great powers.[2] He rejected the principle of *Ahimsa* [non-violence] as a matter of state policy.[3] Speaking to the Far

---

[1] NUCLEAR ENERGY PROGRAM-INDIA (U), the U.S. Defense Intelligence Agency, Directorate of Technical Intelligence, pp. 2-4. For full details, see Chapter Three, Section 2, pp. 68-73.

[2] See Chapter Two, section 1, p. 31.

[3] *Lok Sabha Debates*, Part 2, Vol. 1, 15 February 1956, Col. 814-15. Also see Chapter Two, section 1, p. 29.

East American Council of Commerce and Industry, he admitted that India's approach to its problems was not doctrinaire, but pragmatic except its insistence on the democratic method.[4] This in itself contradicted his claim of politico-moral superiority. Nehru envisioned a **'Greater India'** [Maha Bharat] and aspired for a role in the world affairs commensurate with its size and power potential.[5] He believed that the only way to realize that objective lay in its socio-economic development and scientific-industrial progress.[6] Being a pragmatic statesman, he looked for practical solutions to India's problems but rationalized them into philosophical principles. He opted for non-alignment vis-a-vis the superpowers, peaceful co-existence with China and a power-politics approach in South Asia.[7] He occasionally used force to resolve territorial disputes with India's smaller neighbours. He campaigned for general and complete disarmament but rejected unilateral nuclear disarmament for India.[8] However, despite Nehru's vigorous campaign for general nuclear disarmament, the evidence indicates his awareness that it was not an attainable goal under the cold-war paradigm.[9]

Nehru attached the highest priority to the development of atomic energy as a vehicle for development and power. His pre-independence views did not rule the employment of nuclear energy for "defence" and "protection" of India.[10] After independence, while seeking foreign technological and finan-

---

[4] Chapter Two, section 1, pp. 29-30

[5] ibid, p. 28.

[6] ibid, pp. 28-29.

[7] ibid, Section 2, pp. 35-50.

[8] See Chapter Two, section 4, pp. 51-56.

[9] ibid.

[10] See Chapter Three, section 1, pp. 58-67.

cial assistance for the development of atomic energy, he opted for vague and ambiguous terms such as 'evil' and 'destructive' for providing assurances of its 'only peaceful use'. It appears that he deliberately avoided the term, 'military use'.[11] On the other hand, a scrutiny of Indian government's thinking in that period indicates that it did not consider the use of atomic energy for defence and military purposes as evil or destructive.[12] Nehru's government refused to accept the application of international safeguards to verify the assurances India gave for the only peaceful use of atomic energy.[13] It argued that international safeguards on atomic energy were not only discriminatory, but impinged upon the Indian national sovereignty.[14]

Nehru was the political architect of the Indian nuclear option. It was realized in his life-time by the completion of two safeguards-free nuclear facilities, CIRUS reactor in 1960 and Trombay Reprocessing Plant in 1964.[15] Both these facilities were acquired under assurances of 'only peaceful use' but there were no verification provisions. Bhabha planned a nuclear weapons capability within the structural framework of civilian nuclear programme by opting for dual-purpose technologies.[16] Documentary evidence of Bhabha's interest in nuclear weapons technology dates back to the same year (January 1954) when he sought cooperation of the U.S. AEC officials for collecting observational data on atomic

---

[11] ibid.

[12] ibid. Also see, British Foreign Office Records, FO 371 / 149591, dated 23 January 1960.

[13] See Chapter Three section 3, 81-88.

[14] ibid.

[15] ibid, pp. 74-81.

[16] ibid, pp. 68-81.

explosions.[17] At that time, the concept of plowshares for the use of peaceful nuclear explosions (PNEs) for underground engineering purposes had not been developed and his search for data on atomic explosions was motivated by a quest for nuclear weapons technology. It is improbable that he would have approached the U.S. AEC officials on such a sensitive matter without Nehru's prior consent. It suggests that Nehru and Bhabha wanted to create the basis for a nuclear weapons option for deterrent in extremis. It was inspired by a strategic perspective, but they wanted to pursue it without a formal acknowledgement. The origin of India's doctrine of nuclear ambiguity dates back to the Nehru era.

Successive Prime Ministers of India pursued a similar course and expanded the nuclear weapons capability cloaked in the policy of ambiguity. Prime Minister Shastri took a decisive step forward and sanctioned the work on a Subterranean Nuclear Explosion (SNE) Project after the first nuclear test by China.[18] The decision for the SNE project was hardly surprising in view of the direction of India's nuclear programme in 1962-1963, when Nehru and Bhabha indicated the "built-in defence" use and feasibility of a nuclear device.[19] Shastri's interim strategy focussed on seeking nuclear security guarantees from the superpowers and Britain against China until India developed its own nuclear weapons capability.[20] However, he gradually drifted away from that approach once India recovered from the initial impact of the 1964 Chinese nuclear test. As a long-term strategy, his government regarded extended nuclear security guarantees as inadequate,

---

[17] ibid, pp. 64-65. Also see, Department of State, Central File, 891.2546 / 1-2954, dated 29 January 1954.

[18] See Chapter Four, section 1, pp. 98-102.

[19] See Chapter Three, section 2, pp. 80-81.

[20] See Chapter Four, section 2, pp. 102-09.

unreliable and incredible. India wanted to develop a nuclear weapons capability and the provision of nuclear security guarantees was incompatible with that position.

Mrs. Indira Gandhi postponed the SNE project due to domestic political expediency and unfavourable international environment. Her government rejected the Treaty on Non-Proliferation of Nuclear Weapons (NPT).[21] She decided to convert the nuclear option into a weapons capability by carrying out the 1974 nuclear test. The test was a logical culmination of India's traditional nuclear policy. Evidence suggests that the 1974 test had a configuration close to a weapon test and its triggering mechanism had military significance.[22] It was termed a PNE because India used plutonium recovered from the CIRUS reactor (meant for 'only peaceful use') and reprocessed at the Trombay Reprocessing Plant. It was presented as a low-risk measure to appear less provocative to India's two main nuclear suppliers, Canada and the United States. However, both rejected the PNE rationale and eventually terminated nuclear cooperation with India. The official Indian report declared the 1974 test a 'successful experiment'.[23] Despite that, there is no known project in India where it has applied the result of that 'successful experiment' in the last 17 years. It appears that the real objective of the 1974 nuclear test was to transform the nuclear option into a weapons capability. Additional objectives were to demonstrate India's technological prowess and reap politico-strategic advantages such as a recognition of its strategic position in the regional and international power

---

[21] <u>ibid</u>, section 3, pp. 110-17.

[22] <u>ibid</u>, pp. pp. 152-54.

[23] <u>ibid</u>, p. 149. Also see, <u>Annual Report 1974-1975: Department of Atomic Energy</u>, GOI, p. 7.

equilibrium.[24] It was also intended to alleviate domestic political pressure generated by the pro-bomb lobby after China's development of nuclear weapons. A CIA study carried out immediately after the 1974 test categorized India among the countries involved in the 'weapons acquisition' attempts and assessed the Indian status as a nuclear capable state, functionally close to a nuclear weapon state.[25] According to a Washington-based report, quoting State Department aide, India produced an unspecified number of nuclear devices during the last years of Mrs. Gandhi's government (1974 to 1977).[26] However, there is no further evidence to back this up.

The 1974 Indian nuclear test intensified Pakistani perceptions of a nuclear threat or blackmail from India. Pakistan rejected Mrs. Gandhi's assurances offered to the late Prime Minister, Zulfiqar Ali Bhutto, that the test had no military implications.[27] The Indian government not only underestimated international reaction to its 1974 test, but also the Pakistani ability to respond so quickly to the threat perceptions generated by the 1974 test. Z.A. Bhutto responded by laying the foundation of a nuclear weapons capability through a widespread network of clandestine operations for illicit acquisition of various elements of a nuclear weapons capability. He had already vowed in 1965 that if India acquired nuclear weapons, Pakistan would follow, even if it meant

---

[24] See Chapter Four, section 5.a, pp. 136-54.

[25] ibid, p. 152-53. Also see, Prospects for Further Proliferation of Nuclear Weapons: A CIA Memoranda No. DCI NIO 1945-74, dated 9/4/74 (S/NFD).

[26] 'Indian Said to Be Building 20 Nuclear Weapons a Year', United Press International, 25 April 1988, PM cycle, referred in Spector, *THE UNDECLARED BOMB*, p. 106.

[27] See Chapter Five, pp. 155-58.

eating grass.[28] After Bhutto's removal, General Zia continued Pakistan's nuclear pursuits under a policy of nuclear ambiguity similar to India. While highlighting the peaceful nature of Pakistan's nuclear programme, Zia developed a nuclear weapons capability. In March 1987, he declared that Pakistan had acquired the capability to make nuclear weapons whenever it liked.[29] By that time, India had also enhanced efforts to expand its nuclear weapons capability in response to Pakistan. It tried to contain Pakistan's nuclear weapons programme through the U.S. pressure but failed. Some reports also suggested that India considered pre-emptive air strikes at Pakistan's nuclear enrichment plant at Kahuta.[30] Since then, India-Pakistan nuclear programmes have been interlocked in an action-reaction paradigm which has defied a mutually acceptable solution despite intensive nuclear diplomacy

After Mrs. Gandhi's electoral defeat in 1977, Prime Minister Morarji Desai stated that Indian scientists could not convince him that a PNE had any economic or peaceful technological objective.[31] His government demonstrated a conditional softness on the issue of nuclear weapons proliferation. In his short tenure, India did not develop nuclear weapons, but refused to accept full-scope safeguards and the NPT until the great powers concluded a comprehensive test ban treaty.[32] However, he was willing to negotiate a solution to the nuclear proliferation issue. As a *quid pro quo* for his conditional softness, he managed to get the enriched uranium fuel for Tarapur atomic reactors from the Carter Administra-

---

[28] *ibid*, section 3, pp. 182-91.

[29] *ibid*, section 4, pp. 191-201.

[30] *ibid*, pp. 195-96.

[31] See Chapter Six, section 1, p. 208.

[32] *ibid*, pp. 208-12.

tion. His successor, Mr. Charan Singh, abandoned Desai's approach and reiterated the traditional nuclear policy. However, his government was too short-lived to make a worthwhile contribution.

After her return to power in 1980, Mrs. Gandhi reiterated India's interest in further nuclear tests.[33] By that time Pakistan's quest for a nuclear weapons capability was well known and India perceived a Pakistani nuclear threat for the first time. Despite emphasizing Indian interest in carrying out more nuclear tests, Mrs. Gandhi actually refrained from that in view of the Indo-U.S. nuclear negotiations.[34] However, Mrs. Gandhi was determined to keep a lead over Pakistan in the field of nuclear weapons technology. She maintained the Pokharan nuclear test site in a state of readiness in case India had to carry out another nuclear explosion.[35] One source pointed out that her government re-assembled the team which carried out the 1974 nuclear test. During her last two years (1983-1984), India not only conducted further research on nuclear weapons but carried out work on thermonuclear weapons technology.[36]

More significant expansion in India's nuclear weapons capability took place under the government of late Prime Minister Rajiv Gandhi when it started recovering large quantities of plutonium from safeguards-free reactors, MAPP-I, MAPP-II and DHRUVA in 1986-1987.[37] Rajiv Gandhi was relatively less equivocal in projecting nuclear ambiguity and

---

[33] ibid, pp. 214-19. Also see, 'Gandhi Says National Interest May Require Nuclear Blasts', WASHINGTON POST, 14 March 1980.

[34] ibid, section 2, pp. 214-19.

[35] ibid.

[36] ibid.

[37] ibid, section 3, pp. 220-25.

often stressed the imperative of reconsidering the policy of not making nuclear weapons.[38] In one interview, Rajiv Gandhi indicated that India might have manufactured nuclear weapon components to meet the Pakistani threat contingency and could assemble them rapidly.[39] He concentrated on developing military power in all branches of the Indian armed forces to unprecedented levels, including the induction of nuclear powered submarines on lease from the Soviet Union.[40] Under his government, the expansion of Indian nuclear weapons capability was more rapid than any of its predecessor.[41] India test-fired an intermediate range ballistic missile, Agni (fire) on 22 May 1989.[42] Agni provided a substantial boost to India's power potential with its 2,000 pounds payload and 2,500 km range.[43] Rajiv Gandhi, like Nehru, also demonstrated an interest in global nuclear disarmament. During his government, India concluded an agreement with Pakistan not to attack each other's nuclear facilities in December 1988, which has not been ratified so far. The expansion of the Indian nuclear weapons capability continued in the post-Rajiv period despite a state of political instability during the two Janata governments in 1989-1991. The newly installed government of Mr. Narsima Rao might not arrest the tendency.

In 1988-1989, many reports suggested that India was not only producing nuclear weapons components, but also

---

[38] ibid.

[39] ibid.

[40] ibid, pp. 225-29.

[41] ibid. Also See Chapter Seven, section 3, (pp. 290-95), section 4 (PP. 295-97) and section 5 (pp. 298-308).

[42] Chapter Seven, section 5.c, pp. 306-08.

[43] ibid.

engaged in the development of thermonuclear weapons.[44] This expansion continued under the traditional policy of ambiguity. A wide range of evidence indicates that India is secretly producing nuclear weapons components which can be assembled in a crisis-situation and deployed by an aircraft-based delivery system.[45] It now possesses various elements of a limited nuclear force, although there are different estimates.[46] The various elements of an Indian nuclear deterrent are not yet put together as an assembled force, and so far there is no public evidence that India has integrated nuclear weapons into its armed forces. Nothing is known about the likely deployment procedures and command, control and communication (C^3) network, or targeting acquisition options. That indicates the formulation of a nuclear strategy wherein India has developed various elements of a nuclear force, and an imminent capability to assemble and deploy, if so required. Pakistan, too, has moved ahead towards the development of various components of a crude nuclear deterrent.[47]

South Asia appears to be gradually drifting towards an undeclared state of primitive nuclear deterrence which is unique because of deliberate ambiguities generated by India and Pakistan. South Asian nuclear deterrence is implicit in nature rather than based upon explicit and declared statements of mutual deterrent postures. Neither India nor Pakistan acknowledge the development of nuclear weapons in assembled or unassembled forms despite a wide range of evidence to the contrary. India's capability is larger in size than Pakistan. It has the advantage of testing a nuclear device in 1974. The

---

[44] ibid, pp. 309-12.

[45] ibid.

[46] ibid. Also see appendices VI, VII and VIII.

[47] See Chapter Five, section 2, pp. 175-81.

delivery systems are aircraft-based at the moment. There is no conclusive evidence of nuclear capable ballistic missile operational as yet, but may be added in the near future once nuclear warheads are developed. India's recently tested IRBM, Agni is a decisive advantage over Pakistan.

Despite the Indian nuclear superiority, Pakistani officials claim a nuclear deterrent against India. General Zia personally generated such an impression in June 1988.[48] He claimed the effectiveness of Pakistan's nuclear deterrent even if it possessed less nuclear weapons than India.[49] The Indian response to Zia's claim was less explicit. Indian officials responded by alluding to the advancement and sophistication of their nuclear weapons capability.[50] If this trend goes unabated and both countries continue to act on worst-case scenarios, they could assemble nuclear forces in the near future. The dynamics of nuclear deterrence in South Asia may be quite different from the existing models. It may be unstable because of its primitive nature and the underlying ambiguous postures of the two states. The essential pre-requisite of stable deterrence is that the parties present explicit statements of their strategic postures and behaviour they are likely to adopt in case of further deterioration in their relations. India and Pakistan's refusal to acknowledge their nuclear weapon programmes, and the absence of explicit strategic doctrines make the task of developing a plausible hypothesis about the dynamics of nuclear deterrence in South Asia as speculative.

---

[48] See Chapter Five, section 4, pp. 200-201.

[49] ibid. I was also present at the occasion as a member of the delegation when General Zia made this statement.

[50] See statements of the late Prime Minister Rajiv Gandhi and his Defence Minister K.C. Pant in Chapter Six, Section 4, pp. 220-25

Appendix-I

INDIA

RESEARCH REACTORS IN OPERATION AND THEIR PLUTONIUM OUTPUT CAPACITY BY 1991

NAME & LOCATION,		**OPERATION,**	**SAFEGUARDS,**	**PU OUTPUT, PER YEAR**	**TOTAL PU IN KGs**
ASPARA	BARC	1956	Free	Zero	Zero
CIRUS	BARC	1960	Free	9.4	291.4
ZERLINA	BARC	1961	Free	Zero	Zero
PURNIMA-I	BARC	1972 (Replaced in 1983)	Free	Zero	Zero
PURNIMA-11	BARC	1983 (Replaced in 987)	Free	Zero	Zero
PURNIMA-III	BARC	1987	Free	Zero	Zero
KAMINI	IGCAR	1984	Free	Zero	Zero
DHRUVA	BARC	1986	Free	25	125

TOTAL SAFEGUARDS-FREE PU FROM RESEARCH REACTORS BY 1991: 416.4 KG

SOURCES: Annual Reports, **DAE, 1960 to 1991,** *Nuclear India*, **1960-61 to 1990-91,** Research reactors at Trombay, **(Bombay, DAE, 1987),** ANALYSIS OF SIX ISSUES ABOUT NUCLEAR CAPABILITIES OF INDIA IRAQ, LIBYA AND PAKISTAN, **(Washington DC, USGPO, 1982).**

Appendix-II

INDIA

NUCLEAR POWER REACTORS IN OPERATION BY 1991
THEIR ANNUAL POWER (MWe) AND PU (KG) OUTPUT

CODE, NAME & LOCATION,		YEAR OF/,	POWER & PU OUTPUT,			SAFE-/ GUARD
			NET/GROSS		PU	
IN-1, TAPS-I	Tarapur,	1969	148	160	60 kg	IAEA-U.S.
IN-2, TAPS-II	Tarapur	1969	148	160	60 kg	IAEA-U.S.
IN-3, RAPS-I,	Kota	1972	202	220	60 kg	IAEA-CAN.
IN-4, RAPS-II,	Kota	1981	202	220	60 kg	IAEA-USSR
IN-5, MAPS-I,	Kalpakam	1983	220	235	60 kg	Free
IN-6, MAPS-II,	Kalpakam	1985	220	235	60 kg	Free
IN-7, NAPP-I,	Narora	1990	220	235	60 kg	Free
IN-8, NAPP-II,	Narora	1991	220	235	60 kg	Free

NUCLEAR POWER REACTORS UNDER CONSTRUCTION

IN-9, KAPP-I,	Kakrapar	1992	220	235	60 kg	Free
IN-10, KAPP-II,	Kakrapar	1992	220	235	60 kg	Free
IN-11, RAPS-111	Kota	1995	220	235	60 kg	Free
IN-12, RAPS-IV	Kota	1995	220	235	60 kg	Free
IN-13, KAIGA-I	Kaiga	1995	220	235	60 kg	Free
IN-14, KAIGA-11	Kaiga	1995	220	235	60 kg	Free

SOURCES: Annual Reports, DAE, 1960 to 1991, *Nuclear India*, 1960 to 1991, NUCLEAR ENERGY PROGRAM-INDIA (U), the U.S. Defence Intelligence Agency, pp. 1-23, *World Nuclear Industry Handbook, 1990* (Sutton, Nuclear Engineering International, 1990), *Nuclear Power Reactors in the World*, (Vienna, IAEA, 1986).

Appendix-III

INDIA

HEAVY-WATER PRODUCTION PLANTS IN INDIA AND THEIR ANNUAL CAPACITY IN METRIC TONS

S/ NO.	LACTATION	ANNUAL CAPACITY IN METRIC TONNES
1.	Nangal (Punjab)	14
2.	Baroda (Gujrat)	45
3.	Kota (Rajasthan)	85
4.	Tuticorin (Tamil Nadu)	49
5.	Talcher (Orissa)	50
6.	Thal-Vaishet (Maharashtra)	110
7.	Manugura	185
8.	Hazira (Gujrat)	110
TOTAL PLANNED CAPACITY ESTIMATED:		**648-650 MT**

Most of these plants are not operating due to different reasons like design faults, operational in-experience and accidental closures. Against a planned output capacity of 300 to 400 metric tonnes in 1985, India could only produce 50 MT. The production has recently gone up but precise figure are not available. Therefore, India has heavily relied on the imports of heavy-water. A few of the major suppliers for legally imported heavy-water are Canada, the U.S. and the Soviet Union. According to Milholin. Indian inventory of this material at present 1038 MT. The Indian requirement is estimated at 1239 MT. The difference, according to Gary Milholin, is being met through Illicit imported amounts through Norwegian, Swiss and German firms.

SOURCES: Annual Reports, DAE, 1960 to 1991, *Nuclear India*, 1960-61 to 1991, Gary Milholin, HEAVY-WATER IN INDIA: A STUDY (Washington DC, Wisconsin Project no Nuclear Arms control, 1986), unpublished.

Appendix-IV

INDIA

REPROCESSING PLANTS IN INDIA AND THEIR CAPACITY TO REPROCESS RADIOACTIVE WASTE IN METRIC TONS PER YEAR

NAME & LOCATION,	YEAR OF OPERATION,	CAPACITY,	SAFEGUARDS
TRP* (Trombay)	1964	100 MT	Free
PREFRE (Tarapur)	1979	100 MT	Free**
KARP (Kalpakkam)	1990-91	125 MT	Free
TOTAL REPROCESSING CAPACITY BY 1991:		**325 MT**	**FREE**

Two more reprocessing plant are planned to be installed under the Nuclear Planning Profile 1985-2000 AD, each with a capacity of 400 MT but their location and operation schedule have not been disclosed so far.

* TRP: Trombay Reprocessing plant had initially a capacity of 30 MT but was refurbished in late 1970s and its capacity was raised up to 100 MT.

** PREFRE: (Power Reactors Fuel Reprocessing). Safeguards are only applicable on PREFRE when it reprocesses fuel which is under safeguards but not otherwise.

KARP: (Kalpakkam Reprocessing Plant).

SOURCES: Annual Reports, DAE, 1986-1987, *Nuclear India*, 21 (6 & 7), 1983 and 23 (1), 1984, Special Issue, and NUCLEAR ENERGY PROGRAM-INDIA (U), the U.S. Defence Intelligence Agency, p. 17.

Appendix-V

INDIA

TOTAL ACCUMULATED SAFEGUARDS-FREE PLUTONIUM IN INDIA FROM RESEARCH AND POWER REACTORS IN KILOGRAMS

NAME & TYPE,	YEAR OF/, operation	TOTAL OUTPUT BY:	1991,	1995,	2000
CIRUS*	1960	9.4 kg annual	291.4	329	376
MAPP-I	1983	60 kg annual	480	720	1020
MAPP-II	1985	60 kg annual	360	600	900
DHRUVA	1986	25 kg annual	125	225	350
NAPP-I	1990	60 kg annual	60	300	600
NAPP-II	1991	60 kg annual	--	240	540
KAPP-I	1991-92	60 kg annual	--	180	480
KAPP-II	1991-92	60 kg annual	--	180	480
RAPS-III	1995	60 kg annual	--	---	300
RAPS-IV	1995	60 kg annual	--	---	300
KAIGA-I	1995	60 kg annual	--	---	300
KAIGA-II	1995	60 kg annual	--	---	300
TOTAL ACCUMULATED PU FROM CIRUS BY:			**291.4**	**329**	**376**
TOTAL ACCUMULATED SAFEGUARD-FREE (excluding CIRUS) .... BY:			**1025**	**2445**	**5570**
TOTAL SAFEGUARD-FREE PU........BY:			**1316.4**	**2774**	**5946**

The plutonium recovered from CIRUS is worked out separately from the rest of stockpile that India could use for weapons purposes. India needs some quantities of plutonium for R & D and as fuel for the FBTR which can be met from the CIRUS.
SOURCES: As in appendix I & II; *Nucleonics Week*, 15 August 1985, **INFCE,** Report of the Working Group 1, **the IAEA, 1980** and Warren H. Donnelly, INDIA AND NUCLEAR WEAPONS, a CRS Issue Brief Updated 30 March 1989. All the planned reactors may not go into operation on schedule because of the heavy-water shortage and other technical problems. Therefore, the future estimates are bound to be approximate.

Appendix-VI

INDIA

INDIA'S SAFEGUARD-FREE WEAPON-GRADE PLUTONIUM (ESTIMATED) AND ITS NUCLEAR WEAPONS CAPABILITY

YEAR	PU IN KGs,	ESTIMATED NUMBER OF NUCLEAR WARHEADS		
		8 KG	10 KG	20 KG*
1991	1025	128	102	51
1995	2445	305	244	122
2000	5570	696	557	278

* It is generally presumed on the basis of its state of technological development at present, that India may not have the technology to fabricate bigger than 20 kg (plutonium) nuclear warheads at the moment but might be able to do so in future.

Please note that this estimate does not include plutonium recovered from CIRUS which is free from international safeguards but India has assured to use the reactor for peaceful purposes. This estimate is approximate in view of the fact that no accurate information is available on how much plutonium India has set aside for R & D and fuel requirements for the FBTR from its safeguard-free stockpile or using only the plutonium recovered from CIRUS and from the reactors under safeguards, like TAPS-I & II and RAPS-I & II. India can use plutonium from its reactors under safeguards for the above requirements.

SOURCES: As per appendices I, II and the data collation worked out in appendix-V.

Appendix-VII

INDIA

INDIA'S AIRCRAFT-BASED (NUCLEAR-CAPABLE) DELIVERY SYSTEM

NAME	NUMBER	COMBAT-RADIUS AND CAPABILITIES
MIG-27	80 (5 sqn)	600 miles: A high performance and versatile bomber.
Jaguars	80 (5 sqn)	650 miles: A low-flight and deep-penetration strike aircraft.
MIG-29	50 (3 sqn)	600 miles: An all-weather and multiple-role aircraft.
Mirage 2000	46 (3 sqn)	650 miles: A sophisticated multiple role aircraft.
MIG-25*	8-12 (1 sqn)	A high altitude reconnaissance aircfart for strategic surveillance.

* Exact number of MIG-25 acquired by India is not known.

SOURCES: **MILITARY BALANCE 1986-87 TO 1990-91**, (London, IISS), Spector with Smith, pp. 78-79, and Elkin and Ritezel, 'The Indo-Pakistan Military Balance', *Asian Survey*, XXVI (5), May 1986.

Appendix-VIII

INDIA

INDIA'S PRESENT BALLISTIC MISSILE CAPABILITY

NAME & Type,	RANGE,	PAYLOAD,	LAUNCHER,	TEST-DATE,	DEPLOY-/ MENT
PRITHVI SSM	200 miles	(2,200 LB) (1,000 KG)	mobile	25-2-88	1991-92
AGNI IRBM	1,500 miles 2,500 km	(2,200 LB) (1,000 KG)	SLV-3 fixed	22-5-89	Not known

INDIA'S FUTURE LAUNCH VEHICLES AND BALLISTIC MISSILE CAPABILITY

LAUNCH VEHICLE,	RANGE	PAYLOAD,	DATE,	MISSILE	RESULT
SLV-3	2,500 km	1,000 kg	22-5-89	IRBM:	successful
ASLV(1st test)	---	---	24-3-87		unsuccessful
ASLV(2nd test)			13-7-88		unsuccessful
PSLV	---	1,000 KG	1994-1995	IRBM	
GSLV	36,000 km	2,500 kg	late 1990s	ICBM	
	22,000 miles	5,500 LB	late 1990s	ICBM	

SOURCES: MISSILE PROLIFERATION: SURVEY OF EMERGING MISSILE FORCES, CRS Report for the U.S. Congress, 3 October 1988, pp. CRS-71-77; 'India Succeeds in Missile Test Launching', WASHINGTON POST, 26 FEB 1988; 'India "has Nuclear Arsenal', THE INDEPENDENT, 22 March 1988; 'Gandhi denies nuclear application as India launches missile', THE TIMES, 23 May 1989; Spector with Jacqueline Smith, p. 74; Elkin and Fredericks, 'Military Implications of India's Space Program,' *Air University Review*, May-June, 1983, pp. 58-60.

There is no evidence so far that India has developed nuclear warheads for its ballistic missile, Agni.

Appendix-IX

PAKISTAN

PAKISTAN'S ESTIMATED NUCLEAR WEAPONS CAPABILITY

WEAPONS -GRADE MATERIAL

PLANT & LOCATION,	OUTPUT CAPACITY: WGU PER YEAR KGs	BY YEAR: 1991	1995	2000
Uranium Enrichment Plant Kahuta	50	250	450	700

PAKISTAN'S ESTIMATED NUCLEAR WEAPONS CAPABILITY

YEAR	WGU IN KGs	ESTIMATED NUMBER OF NUCLEAR WARHEADS 15 KG	20 KG	25 KG
1991	250	16	12	10
1995	450	30	22	18
2000	700	46	35	28

I) Kahuta plant's capacity for producing weapons-grade (90 % enriched) uranium is estimated at 50 kg year and it is known to be operational at that capacity since 1986. See Chapter Five, pp. 163-168 and Hedrick Smith, 'A-Bomb Ticks in Pakistan', NEW YORK TIMES (magazine), 6 March, 1988, p. 38.

II) About 15 to 30 kg of weapon-grade uranium is regarded suitable for reliable and sophisticated nuclear warheads, Office of Technology Assessment, NUCLEAR PROLIFERATION AND SAFEGUARDS (New York, Praeger, 1977), p. 30.

III) Pakistan is known to be in the process of fabrication of nuclear weapons components at Pakistan Ordnance Factory, Wah, and has already tested in 1986 non-nuclear components of a nuclear device based on the implosion technique, See Chapter Five, pp. 163-68.

Appendix-X

PAKISTAN

PAKISTAN'S NUCLEAR-CAPABLE DELIVERY SYSTEMS

AIRCRAFT-BASED DELIVERY SYSTEM

NAME	NUMBER	COMBAT RADIUS AND CAPABILITIES
F-16	37 - 39	650 miles: A highly sophisticated bomber considered better for nuclear delivery missions than any aircraft in the Indian inventory.[1]
Mirage-V		600 miles: A multiple role medium bomber.

PAKISTAN'S BALLISTIC MISSILE CAPABILITY

NAME & TYPE,	RANGE,	PAYLOAD & LAUNCHER,	TEST	DEPLOYMENT
HAFT-I SSM	80 km (50 miles)	500 kg	1988	1989
HAFT-II SSM	300 km (185 miles)	500 kg	1989	1990

SOURCES: 'Pakistan in missile age', *JANES DEFENCE WEEKLY*, 18 February 1889; 'Pakistan Enters Missile Age: General Beg's Disclosure', *DEFENCE JOURNAL* (karachi); and 'Pakistan develops missiles', *FLIGHT INTERNATIONAL*, 15 April. For aircraft capabilities, see MILITARY BALANCE: 1989-1990 (London, IISS, 1990).

---

[1] The U.S. Assistant Secretary of State, James L. Buckley testified its capabilities for nuclear delivery missions before Senate Committee on foreign Relations, AID AND THE PROPOSED ARMS SALE OF F-16's TO PAKISTAN: HEARING BEFORE COMMITTEE ON FOREIGN RELATIONS, UNITED STATES SENATE, 97th Congress, 1st Session, 12-17 November 1981 (Washington DC, USGPO, p. 13.

BIBLIOGRAPHY

PRIMARY SOURCES

National Archives, Washington DC.

1. General Records of the Department of State: Record Group No. 59
2. Department of State, Central File 791.5 MSP: National Defense Affairs of India.
3. Department of State, Central File 791.5611: Atomic Energy; Military Use in India.
4. Department of State, Decimal File 891.2546: Strategic Exports, India.
5. Department of State, Records of the Special Assistant to the Secretary of State for Atomic Energy Matters, 1944-1952.

Liddell Hart Centre for Military Archives, King's College, London.

U.S. Policy towards South Asia

1. NSC 5409, 18 February 1955.
2. NSC 5617, 7 December 1955.
3. NSC 5701, 14 January 1957.
4. NSC 5909, 22 July 1959.
5. NSC 6105, 16 January 1961.

Development of Atomic Energy

1. NSC 5431, 6 August 1954.
2. NSC 5431/1, 13 August 1954.
3. NSC 5507/1, 1 March and 20 June 1955.
4. NSC 5507/2, 12 March and 21 December 1955, 15 August 1956, and 22 April 1957.

India: Documents on Disarmament, 1945 to 1982.

Pakistan: Documents on Disarmament, 1974 to 1982.

National Security Archives, Washington DC.

A Preliminary Catalogue of Documents: Nuclear Non-Proliferation Collection, 1989.

Lyndon Baines Johnson Library, Austin, Texas.

1. National Security File, Committee File - Committee on Nuclear Proliferation, India Box 6.

2. National Security File, Country File, India.

Gerald R. Ford Library, Ann Arbor, Michigan.

1. White House Central Files, CO. TA 3 / 66, India.
2. White House Central Files, CO. 115, Pakistan.

DOCUMENTS

1. **Annual Reports** DAE, 1965-1966 to 1988-1989, Department of Atomic Energy, Government of India, Bombay.
2. **Annual Reports** PAEC, 1974-1975 to 1986-1987, Pakistan Atomic Energy Commission, Government of Pakistan, Islamabad.
3. **Annual Reports**, Ministry of Defence, 1964-65 to 1986-87, Government of India, New Delhi.
4. **Lok Sabha (Indian Parliament) Debates**, 1947 to 1990.

5. **US Department of State**

Foreign Relations of the United States,
1952-1954, Volume XI, Part 2, South Asia, USGPO, 1984.

1955-1957, Volume VIII, South Asia, USPGO, 1987.

6. **US Congressional Hearings and CRS Reports**

Aid and the Proposed Arms Sales of F-16's to Pakistan, Hearings before the Committee on Foreign Relations, United States Senate, 12 & 17 November 1981, USGPO, Washington 1982.

Export of Nuclear Fuel to India, Hearings and Markup before the Committee on International Relations, House of Representatives, 23 May, 8 and 14 June 1978, USGPO, 1978.

India-Pakistan Nuclear Issues, Hearing before the Committee on Foreign Relations, United States Senate, 18 March 1980, USGPO, Washington 1980.

Nuclear Proliferation: Future U.S. Foreign Policy Implications, Hearings before the Sub-Committee on International Security and Scientific Affairs, of the Committee on International Relations, House of Representatives, 21, 23, & 30 October and 4 & 5 November 1975, USGPO, Washington, 1975.

Nuclear Proliferation: The Situation in Pakistan and India, Hearing before the Sub-Committee on Energy, Nuclear Proliferation and Federal Services, of the Committee on Government Affairs, United States Senate, 1 May 1979, USGPO, Washington 1979.

Nuclear Non-Proliferation and U.S. National Security,
Hearings Before the Committee on Governmental Affairs, United States Senate, 24 & 25 February and 5 March 1987, USGPO, Washington, 1987.

Nuclear Proliferation: Dealing With Problem Countries, Hearing before the Sub-Committees on International Security and Scientific Affairs, and on International Economic Policy and Trade, of the Committee on Foreign Affairs, House of Representative 23 July 1981, USGPO, Washington, 1981.

Resolutions of Disapproval Pertaining to the Shipment of Nuclear Fuel to India, Hearings and Markup before the Committee on Foreign Affairs, House of Representatives, 26 June, 23 July and 10 September 1980, Washington, 1980.

Security and Economic Assistance to Pakistan,
Hearings before the Committee on Foreign Affairs, House of Representatives, and its Sub-Committee on International Security and Scientific Affairs, on International Economic Policy and on Asian and Pacific Affairs, 27 April, 16, 22 & 23 September and 17 & 19 November 1981, USGPO, Washington, 1982.

The Tarapur Nuclear Fuel Export Issue, Joint Hearings before the Committee on Foreign Relations, United States Senate, 18 & 19 June 1980, USGPO, Washington, 1980.

Analysis of Six Issues About Nuclear Capabilities of India, Iraq, Libya and Pakistan,
Prepared for the Sub-Committee on Arms Control, Oceans, International Operations and Environment, of the Committee on Foreign Relations, United States Senate, by the Environment and Natural Resources Policy Division, January 1982, USGPO, Washington 1982.

Robert D. Shuey, et. al.,
Missile Proliferation: Survey of Emerging Missile Forces, CRS Report for Congress, 3 October 1988, Washington, 1988.

Nuclear proliferation Fact Book,
CRS Report for the Sub-Committee on Energy, Nuclear Proliferation and Federal Services, of the Committee on Government Affairs, United States Senate, by the ENR Division, Washington, September 1980.

Nuclear Proliferation in South Asia: Containing the Threat, A Staff Report to the Committee on Foreign Relations, United States Senate, August 1988, USGPO, Washington, 1988.

The United States, India, and South Asia: Interests, Trends, and Issues for Congressional Concern, Prepared at the request of the Sub-Committee on Asian and Pacific Affairs, Committee on International Relations, 11 August 1978, USGPO, Washington, 1978, reproduced in 13 November 1980.

Tarapur Nuclear Fuel Export, Report of the Committee on Foreign Relations, United States Senate, together with Minority Views, 15 September (Legislative Day 12 June), 1980, Washington, 1980.

7. **Published Reports**

A Short History of Non-Proliferation, International Atomic Energy Agency, Vienna, IAEA, 1976.

Atomic Energy and Space Research: A Profile for the Decade, Department of Atomic Energy, Government of India, New Delhi, 1970.

Fuel and Heavy Water Availability, Report of the working Group 1, International Nuclear fuel Cycle Evaluation, Vienna, IAEA, 1980.

Market Survey of Nuclear Power for Developing Countries, Vienna, IAEA, 1975.

Nuclear Power Reactors in the World, 1986 Edition, Vienna, IAEA, 1986.

Nuclear Weapons and South Asian Security, Report of the Carnegie Task Force on Non-Proliferation and South Asian Security, Carnegie Endowment for International Peace, Washington DC., 1988.

Peaceful Nuclear Explosions,
Vienna, IAEA, 1975.

UN General Assembly,
General and Complete Disarmament: Comprehensive Study on Nuclear Warfare, Report of the Secretary-General, UN, 35th Session, A/35/392, 12 September 1980.

US Office of Technology Assessment,
Nuclear Proliferation and Safeguards, Vol. II, Washington DC, Library of Congress, 1977.

8. **Public Papers of the Presidents**

Jimmy Cater; 1977 to 1980.

Ronald Reagan; 1981 to 1988.

UNPUBLISHED REPORTS

Jones, Rodney W.
Proliferation of Small Nuclear Forces, Technical Report prepared for Director, Defense Nuclear Agency, DNA-TR-82-125, 30 April 1983.

King, John Kerry (ed.),
International Political Effects of the Spread of Nuclear Weapons, A collection of essays written for a colloquium sponsored by the Office of Regional and Political Analysis, National Foreign Assessment Center, Central Intelligence Agency, April 1979, approved for release on 17 April 1984, Document Expediting (DOCEX) Project, Exchange and Gift Division, Library of Congress, Washington DC.

Spector, Leonard S.,
Report of Visit to India and Pakistan by the Delegation of the Carnegie Task Force on Non-Proliferation and South Asian Security, June-July 1988, Washington DC., Carnegie Endowment for International Peace, October 1988.

Wohstetter, Albert, et. al.,
Moving Towards Life in a Nuclear Armed Crowd? Final report prepared for the US ACDA, by Pan Heuristics, a Division of Science Applications Inc., ACDA / PAB-263, 4 December 1975, revised 22 April 1976.

Wohstetter, Roberta,
The Bhudha Smiles: Absent Minded Peaceful Aid and the Indian Bomb, U.S. Energy Research and Development Administration, Monograph 3, Contract No. (49-1), 3747, 30 April 1977.

D Phil

~~PH.~~ D THESIS

Ziba Moshaver,
The question of Nuclear Weapons Proliferation in the Indian Subcontinent,
Oxford, Oxford University, 1987.

UNPUBLISHED PAPERS

Chopra, Pran,
Change and continuity in India's Foreign Policy,

an unpublished paper read at the Wilton Park Conference 329, organized by the British Foreign Office, 21 to 25 November 1989, Wilton Park, England.

Hart, David,
India's attitudes towards nuclear weapons proliferation,
Brussels, Centre for European Policy Studies, 1986.

Khalilzad, Zalmay,
Research Related to Alternative Nuclear Employment Policy / Technology,
Washington, Defence Nuclear Agency, 1981.

Milhollin, Gary,
Heavy-Water in India,
Washington, Wisconsin Project on Nuclear Arms Control, 1986.

Ram, N.,
India's Nuclear Policy: A Case-Study in the Flaws and Futility of Non-Proliferation,
Chicago, 34th Meeting of the Asian Studies Association, 2-4 April, 1982.

INTERVIEWS

1. K. Subrahmanyam, Nehru Fellow and former Director of Institute of Defence Studies and Analyses, New Delhi, 22 November 1989, 6.00 P.M. Wilton Park, England.
2. Kuldip Nayar, Journalist and former High Commissioner of India in Great Britain, 16 July 1988, 9.30 A.M., New Delhi.
3. Pran Chopra, Centre for Policy Studies, New Delhi, 23 November 1989, 6.00 P.M. Wilton Park, England.

DISCUSSIONS

1. Lt. Gen. (Retired), A. M. Vohra, 14 July 1988, 4.30 P.M., New Delhi.
2. Gary Milhollin, Wisconsin Project on Nuclear Arms Control and former member of the Nuclear Regulatory Commission, 14 April 1989, 5.00 P.M., Washington DC.
3. Jasjit Singh, Director, Institute of Defence Studies and Analyses, New Delhi, 13 July 1988, 11.00 A.M., New Delhi.
4. Leonard S. Spector, Chairman, Carnegie Task Force on Nuclear Weapons and South Asian Security,

Carnegie Endowment for International Peace, 14 April 1989, 10.30 A.M., Washington DC.

5. Peter Galbraith, Staff Director, U.S. Senate Committee on Foreign Relations, 11 April 1989, 3.00 P.M., Washington DC.

6. Randy Rydell, Specialist on Nuclear Proliferation, Senate Staff, Committee on Government Affairs, United States Senate, 20 April 1989, 12.30 P.M., Washington DC.

7 Richard P. Cronin, CRS Specialist in Asian Affairs, Foreign Affairs & National Defense Division, 18 April 1989, 10.00 A.M., Washington DC.

8. Rodney W. Jones, Consultant, Department of State, 19 April 1989, 12.30 P.M., Washington DC.

9. Robert Flaten, Director of Pakistan Affairs, Department of State, 13 April 1989, 4.00 P.M. Washington DC.

10. Robert Hunter, Center for Strategic and International Studies and former NSC expert on nuclear dissemination, 17 April 1989, 11.45 A.M., Washington DC.

11. Robert Sten Norris, Natural Resources Defense Council, 13 April 1989, 10.30 A.M., Washington DC.

12. S.D. Munni, Professor of International Relations, Jawaharlal University and Editor, South Asia Journal, 15 July 1988, 11.00 A.M., New Delhi.

13. Scott Butcher, Director of India, Nepal and Sri Lanka Affairs, Department of State, 14 April 1989, 3.30 P.M., Washington DC.

14. Shirin Tahir-kheli, Director of South Asia, NSC, 19 April 1989, 10.30 A.M., Washington Dc.

15. Thomas Cochran, Natural Resources Defense Council, 13 April 1989, 8-30 A.M., Washington DC.

16. Thomas P. Thorton, Director of Asian Studies, School of Advanced International Studies, John Hopkins University, and former Director of South Asia, NSC, 12 April 1989, 11.00 A.M., Washington DC.

17. Warren H. Donnelly, Senior Specialist ENR, (Environment and Natural Resources Division), CRS, 11 April 1989, 9.00 A.M., and 18 April 1989, 11.30 A.M., Washington DC.

SECONDARY SOURCES

BOOKS

Ali, Akhtar,
Pakistan's Nuclear Dilemma: Energy and security Dimensions
(Karachi, Economist's Research Unit, 1984).

South Asia: Nuclear Stalemate or Conflagration
(Karachi, Research on Armament and Poverty, 1987).

Bajpai, U.S. (ed.),
India's Security: the Politico-Strategic Environ ment
(New Delhi, Lancers, 1982).

Banarby, C.Frank (ed.),
Preventing the Spread of Nuclear Weapons
(London, Souvenir Press for Pugwash Ltd., 1969).

Nuclear Energy and Nuclear Weapons Proliferation
(London, Tailor & Francis for SIPRI, 1979).

The Nuclear Age
(Stockholm, Almqvist & Wicksil for SIPRI, 1974).

Beaton, Leonard,
The Reform of Power
(New York, Viking Press, 1972).

Beaton, Leonard and Maddox, John,
The Spread of Nuclear Weapons
(London, Chatto and Windus for the Institute of Strategic Studies, 1962).

Bhabani Sen Gupta,
Nuclear Weapons: Policy Options for India
(New Delhi, Sage Publications, 1983).

Bhatia, shyam,
India's Nuclear Bomb
(New Delhi, Vikas, 1979).

Bhutto, Z.A.,
Awakening the People: Speeches of Zulfiqar Ali Bhutto
(Rawalpindi, Pakistan Publication, 1970).

If I an Assassinated
(New Delhi, Vikas, 1979).

Reshaping Foreign Policy: 1958-1966
(Rawalpindi, Pakistan Publications, 1977).

The Myth of Independence,

(Karachi, Oxford University, Press, 1968).

Bobrow, D.B.,
Components of Defence Policy
(Chicago, Rand McNally, 1965).

Brecher, Michael,
India's Foreign Policy: An Interpretation
(New York, Institute of Pacific Relations, 1957).

India and World Politics: Krishna Menon's View of the World
(New York, Praeger, 1968).

Nehru's Mantle: The Politics of Succession in India
(New York, Praeger, 1968).

The New States of Asia
(London, Oxford University Press, 1966).

Brito, Dagobert L., Intrilligator, Michael D. and Wick, Adele E.,
Strategies for Managing Nuclear Proliferation,
(Lexington, D.C. Heath and Company, 1983).

Buchan, Alastair,
A World of Nuclear Powers,
(Englewood Cliffs: New Jersey, Prentice-Hall, 1966).

Fallaci, Orianna,
Interview With History
(Boston, Houghton Mifflin Company, 1976).

Cockroft, Sir John, and Menon, M.G.K.,
Homi Jehangir Bhabha, 1909-1966
(London, The Royal Institution of Great Britain, 1967).

Chowdhury, G.W.,
Pakistan's Relations With India 1947-1966
(London, The Pall Mall Press, 1968).

Cohen, Stephen P. (ed.),
The Security of Southern Asia: American and Asian Perspectives,
(Urbana, University of Illinois, 1987).

Connell, John,
Auchinleck
(London, Assell & Company Ltd., 1959).

Das, Durga,
India: From Curzon to Nehru
(London, Collins, 1968).

Das, M.N.,
The Political Philosophy of Jawaharlal Nehru
(London, George Allen and Unwin, 1961).

Dougherty, James E. and Lehman Jr., J.F.,
Arms Control in the Late Sixties
(Princeton, D. Van Nostrand, 1967).

Drell, Sidney D.,
Facing the Threat of Nuclear Weapons
(Seattle and London, University of Washington Press, 1983).

Drieberg, Trevor,
Indira Gandhi: A Profile in Courage
(New Delhi, Vikas, 1972).

Dunn, Lewis A.,
The Role of Sanctions in Non-Proliferation Strategy,
(New York, Hudson Institute for the Office of Technology Assessment, 1977).

Epstein, William,
The Last Chance: Nuclear Proliferation and Arms Control
(New York, The Free Press, 1976).

Fischer, George,
The Non-Proliferation of Nuclear Weapons
(London, Europa Publications, 1971).

Goldblat, Joseph (ed.),
Nuclear Proliferation: The Why and Wherefore,
(London, Tailor & Francis for SIPRI, 1985).

Gompert, David C., et. al.,
Nuclear Weapons and World Politics
(New York, McGraw-Hill Book Company, 1977).

Greenwood, Ted, et.al.,
Nuclear Proliferation: Motives, Capabilities and Strategies for Control
(New York, McGraw-Hills, 1977).

Hart, David,
Nuclear Power in India
(London, George Allen and Unwin, 1984).

Henderson, P.D.,
India: The Energy Sector
(Oxford, Oxford University Press for the World Bank, 1975).

Indira Gandhi,
Selected Speeches: January 1966-August 1971

(New Delhi, Government of India, 1971).

Prime Minister Indira Gandhi: Statements on Foreign Policy
(New Delhi, Ministry of External Affairs, GOI, 1982).

The Speeches and Reminiscences of Indira Gandhi: the Prime Minister of India
(London, Hodder and Stoughton, 1975).

Jain, J.P.,
India and Disarmament: Nehru Era, an Analytical Study
(New Delhi, Radiant Publishers, 1974).

Nuclear India Vol. II
(New Delhi, Radiant Publishers, 1976).

Jones, Rodney W. (ed.),
Small Nuclear Forces and U.S. Security Policy: Threats and Potential Conflicts in the Middle East and South Asia,
(Lexington, D.C. Heath and Company, 1984).

Nuclear Proliferation: Islam, the Bomb and South Asia,
(Washington DC., Center for Strategic and International Studies, 1981).

The Nuclear Suppliers and Nonproliferation: International Policy Choices,
(Lexington, D.C. Heath and Company, 1985).

Kapur, Ashok,
India's Nuclear Option: Atomic Diplomacy and Decision Making
(New York, Praeger Publishers, 1976).

International Nuclear Proliferation: Multilateral Diplomacy and Regional Aspects
(New York, Praeger Publishers, 1979).

Pakistan's Nuclear Development
(London, Croom Helm, 1987).

Karp, Regina Cowen (ed.),
Security With Nuclear Weapons?: Different Perspectives on National Security,
(Oxford, Oxford University Press for SIPRI, 1991).

Kaushik, M.B.,
Pakistan's Nuclear Bomb
(New Delhi, Sopan Publishing House, 1980).

Kavic, Lorne J.,
India's Quest for Security: Defence Policies, 1947-1965
(Berkeley and Los Angeles, California University Press, 1967).

Kemp, Geoffrey, Pfaltzgraff, Robert L. Jr. and Ra'anan, Uri,
The Superpowers in a Multinuclear World
(Lexington, D.C. Heath and Company, 1974).

Khan, Munir Ahamd,
Pakistan's Nuclear Power Programme: Justification and Rationale
(Islamabad, Pakistan Publications, 1979).

Khan, Sadruddin Agha,
Nuclear War, Nuclear Proliferation and Their Consequences
(Oxford, Clarendon Press, 1986).

Khera, S.S.,
India's Defence Problems,
(New Delhi, Orient Publishers, 1968).

Kissinger, Henry A.,
Problems of Nuclear Strategy
(New York, Praeger Publishers, 1970).

Krosney, Herbert and Weissman, Steve,
The Islamic Bomb
(New York, Time Books, 1981).

Kundra, J.C.,
Indian Foreign Policy, 1947-1954
(Groningen, J.B. Wolters, 1955).

Lefever, Ernst W.,
Nuclear Arms in the Third World: U.S. Policy Dilemma
(Washington, Brookings Institution, 1979).

Lomas, Peter and Muller, Harald, (ed.),
Western Europe and the Future of the Nuclear Non-Proliferation Treaty
(Brussels, Centre for European Policy Studies, 1989).

Malik, Zahid,
Dr. Abdul Qadeer Khan and The Islamic Bomb, A Book in Urdu language, titled as, *DR. ABDUL QADEER KHAN AUR ISLAMI BOMB*
(Islamabad, Hurmat Publications, 1989).

Mansingh, Surjit,
India's Search for Power

(Beverly Hills, Sage Publishers, 1984).

Meyer, Stephen M.,
The Dynamics of Nuclear Proliferation
(Chicago, Chicago University Press, 1984).

Mirchandani, G.G.,
India's Nuclear Dilemma
(New Delhi, Popular Book Services, 1968).

Mirchandani, G.G. and Namboodiri,
Nuclear India: A Technological Assessment
(New Delhi, Vision, 1981).

Moraes, Dom,
Indira Gandhi
(London, Jonathan Cape Ltd., 1980).

Naik, J.A.,
The Pakistan Bomb and Rajiv's India
(New Delhi, National Publishing House, 1986).

Nayyar, Kuldip,
India in the Critical Years
(New Delhi, Offset Press, 1977).

Nawaz, Shamsa,
India's Nuclear Weapons Programme
(Lahore, Progressive Publishers, 1985).

Nehru, Jawaharlal,
Foreign Policy of India: Text of Documents
(New Delhi, Lok Sabha Secretariat, 1966).

India's Foreign Policy: Select Speeches, September 1946-April 1961
(New Delhi, Government of India, 1961).

Jawaharlal Nehru's Speeches, Vol. III, 1953-1957
(New Delhi, Government of India, 1958).

Jawaharlal Nehru's Speeches, Vol. IV
(New Delhi, Government of India, 1964).

Jawaharlal Nehru's Speeches, Vol. V, 1963-1964
(New Delhi, Government of India, 1968).

Nuclear Explosions and their Effects
(New Delhi, Government of India, 1958).

The Unity of India: Collected Writings
(London, Lindsay Drummond, 1942).

The Discovery of India
(London, Meridian Books, 1960).

NEI,
World Nuclear Industry Handbook:1990
(Sutton, Nuclear Engineering International, 1990).

Niazi, Kausar,
And the Line Was Cut, A Book in Urdu Language, titled as, *Aur Line Cut Gaee*
(Lahore, Jang Publishers, 1987).

Norman, Dorthy,
Nehru: The First Sixty Years
(New York, John Day Company, 1965).

Northedge, F.S.,
The Foreign Policies of the Powers
(London, Faber and Faber, 1968).

Nyrop, R. and Benderly, B. (ed.),
Area Hand Book for India
(Washington, American University's Foreign Area Studies, 1975).

Overholt, William, H.,
Asia's Nuclear Future
(Colorado, Westview Publishers, 1977).

Palit, D.K. and Namboodiri, P.K.S.,
Pakistan's Islamic Bomb
(New Delhi, Vikas, 1980).

Panikar, K.M.,
Problems of Indian Defence
(Bombay, Asia Publishing House, 1960).

Pathak, K.K.,
Nuclear Policy of India: A Third World Perspective,
(New Delhi, Gitanajali Prakashan, 1980).

Paul, T.V.,
Reaching the Bomb: The Indo-Pakistan Nuclear Scenario
(New Delhi, Dialogue, 1984).

Polsokar, A.,
Minimum Deterrence: India's Answer to China
(Bombay, Thacker, 1969).

Poplai, S.L. (ed.),
Selected Documents on Asian Affairs: India 1947-1950, Vol. 2, Indian Council of World Affairs,
(London, Oxford University Press, 1959).

Poulose, T.T.,
Nuclear Proliferation and the Third World
(New Delhi, ABC Publishing House, 1984).

Perspectives on India's Nuclear Policy
(New Delhi, Young Asia Publishers, 1978).

Potter, William C.,
Nuclear Power and Nonproliferation
(Cambridge Mass:, O G & H Publishers, 1982).

Quester, George H.,
The Politics of Nuclear Proliferation
(Baltimore, The John Hopkins University Press, 1973).

Nuclear Proliferation: Breaking the Chain,
(Madison-Wisconsin, The University of Wisconsin Press, 1981).

Rahman, M.M.,
The Politics of Non-Alignment
(New Delhi, Associated Publishing House, 1969).

Reiss, Mitchell,
Without the Bomb: The Politics of Nuclear Non-Proliferation
(New York, Columbia University Press, 1988).

Sahgal, Nayantara,
Indira Gandhi: Her Road to Power
(London, Mcdonald and Co., 1982).

Sarhadi, Ajit Singh,
India's Security in Resurgent Asia
(New Delhi, Heritage Publishers, 1979).

Sharma, Dhirendra,
India's Nuclear Estate
(New Delhi, Lancer Publishers, 1983).

Shastri, Lal Bahadur,
Speeches of Prime Minister Lal Bahadur Shastri: June 1964-May 1965
(New Delhi, Government of India, 1965).

Sinha, P.B.,
Nuclear Pakistan: Threat to South Asia
(New Delhi, Vision Books, 1980).

SIPRI,
Nuclear Proliferation Problems
(Stockholm, SIPRI, 1974).

Spector, Leonard S.,
Nuclear Proliferation Today
(Cambridge Mass:, Ballinger Publishing Company, 1984).

Going Nuclear
(Cambridge Mass:, Ballinger Publishing Company, 1987).

The Undeclared Bomb

(Cambridge Mass:, Ballinger Publishing company, 1988).

Spector, Leonard S. with Smith, Jacqueline R.,
Nuclear Ambitions: The Spread of Nuclear Weapons 1989-1990
(Boulder, Westview Press, 1990).

Stephen, Ian,
Pakistan
(London, Ernest Benn Ltd., 1963).

Subrahmanyam, K.
A Strategy for a Credible Posture Against a Nuclear Adversary
(New Delhi, Institute for Defence Studies and Analyses, 1968).

India and the Nuclear Challenge
(New Delhi, Lancer, 1986).

(ed.),
Nuclear Myths and Realities
(New Delhi, ABC Publishing House, 1981).

The Indian Nuclear Test in a Global Perspective
(New Delhi, India International Centre, 1974).

Synder, Jed C., and Wells Jr., Samuel F.,
Limiting Nuclear Proliferation
(Cambridge Mass: Ballinger Publishing Company, 1985).

Taseer, Slueiman,
Bhutto: A Political Biography
(London, Ithaca, 1979).

Thomas, Ragu G.C.,
Indian Security Policy
(Princeton, Princeton University Press, 1986).

The Great Power Triangle and South Asian Security
(Lexington, Lexington Books, 1983).

Weinberg, Alvin, et. al.,
The Nuclear Connection
(New York, Paragon Publishers, 1985).

Wilcox, Wayne A.,
India, Pakistan and the Rise of China
New York, ... 1964.

Williams, Shelton L.,
The U.S., India and the Bomb
(Baltimore, The John Hopkins Press, 1969).

Wohstetter, Albert, et. al.,
Swords From Plowshares: Military Potential of the

Civilian Nuclear Energy
(Chicago, Chicago University Press, 1977).

Yager, Joseph A. (ed.),
Non-Proliferation and U.S. Foreign Policy
(Washington, Brookings Institution, 1980).

PAPERS

Anderson, Robert S.,
Building Scientific Institutions in India: Saha and Bhabha, Occasional Paper Series, No. 11, Centre for Developing Area Studies, McGill University, 1975.

Bhargava, G.S.,
India's Security in the 1980s, Adelphi Paper No. 125,
London, IISS, 1976.

Cohen, Stephen P.,
Perception, Influence and Weapons Proliferation in South Asia, Occasional Paper #1,Urbana-Champaign, Office of Arms Control, Disarmament, and International Security, University of Illinois, July 1979.

The Nuclear Futures of South Asia, Occasional Paper 89-2,
Urbana-Champaign, Program in Arms Control, Disarmament and International Security, April 1989.

Dutt, Maj. Gen. D. Som,
India and the Bomb, Adelphi Paper No. 30,
London, IISS, 1966.

Greenwood, Ted, et. al.,
Nuclear Power and Weapons Proliferation, Adelphi Paper No. 130,
London, IISS, 1976-77.

Ispahani, Mahnaz,
Pakistan: Dimensions of Insecurity; Adelphi Paper No. 246,
London, Brassey's for the IISS, Winter 1989/90.

Jones, Rodney W.,
Small Nuclear Forces, The Washington Papers/103, Washington, Praeger for the Center for Strategic and International Studies, 1984.

Kemp, Geoffrey,
Nuclear Forces for Medium Powers: Part I, Targets and Weapon Systems, Adelphi Paper No. 106,
London, IISS, Autumn 1974.

Nuclear Forces for Medium Powers: Parts II and III,

Strategic Requirements and Options, Adelphi Paper No. 107,
London, IISS, Autumn 1974.

Kramish, Arnold,
The Watched and Unwatched, Adelphi Paper No. 36,
London, IISS, June 1967.

Maddox, John,
Prospects for Nuclear Proliferation, Adelphi Paper No. 113,
London, IISS, Spring 1975.

Naim, S. Rashid,
Asia's Day After: Nuclear War Between India and Pakistan?
Urbana-Champaign, Office of Arms Control, Disarmament and International Security, University of Illinois, 1984.

Navias, Martin,
Ballistic Missile Proliferation in the Third World;
Adelphi Paper No. 252,
London, Brassey's for the IISS, Summer 1990.

Sayigh, Yezid,
Confronting the 1990s: Security in the Developing Countries; Adelphi Paper No. 251,
London, Brassey's for the IISS, Summer 1990.

Yager, Joseph A.,
Nuclear Nonproliferation Strategy in Asia, CNSN Paper, Volume 1, No. 3,
McLean-Virginia, Center for National Security Negotiations, 1989.

Waltz, Kenneth N.,
The Spread of Nuclear Weapons: More May Be Better,
Adelphi Paper No. 171,
London, IISS, Autumn 1981.

ARTICLES

Ahmad, Dr. Nazir,
'The Atomic Energy Commission',
Pakistan Quarterly, Vol. X, No. Autumn 1957.

Albright, David, and Zamora, Tom
'India, Pakistan's Nuclear Weapons: all the pieces in place',
Bulletin of the Atomic Scientists, June 1989.

Albright, David,
'Pakistan's Bomb Making Capacity',
Bulletin of the Atomic Scientists, June 1987.

Anderson, Walter, K.,
'India in 1982: Domestic Challenges and Foreign Policy Successes',
Asian Survey, Vol. 23, No. 2, February 1983.

'Election in 1989 in India: The Dawn of Coalition Politcs',
Asian Survey, Vol. XXX, No. 6, June 1990.

Bhabha, Homi, J.,
'Safeguards and Dissemination of Military Power',
Disarmament and Arms Control, Autumn 1964.

Bell, Coral,
'Non-Alignment and Power Balance',
Australian Outlook, Vol. 17, August, 1963.

Betts, Richard K.,
'Incentives for Nuclear Weapons: India, Pakistan and Iran',
Asian Survey, Vol. 19, November 1979.

Chari, P.R.,
'An Indian Reaction to US Non-Proliferation Policy',
International Security, Vol. 3, No. 2, Fall 1978.

Cheema, P.I.,
'India's Nuclear Goals and Policy',
Regional Studies, Vol. 5, No. 2, Spring 1987.

'Pakistan's Quest for Nuclear Technology',
Australian Outlook, Vol. 34, No. 2, August 1980.

'Pakistan's Nuclear Option',
The Journal of South Asian and Middle Eastern Studies,
Vol. 7, Summer 1984.

Cheema, Zafar Iqbal,
'South Asia As a Nuclear Weapons Free-Zone',
Strategic Studies, Vol. 4, No. 2, Winter 1981.

'Pakistan's Case Study for a Nuclear Security Guarantee',
Pakistan Horizon, Vol. 39, No. 1, 1986.

Chopra, Maharaj K.,
'India's Strategic Environment',
Military Review, Vol. LIII, No. 6, June 1973.

Clausen, Peter, A.,
'Nonproliferation Illusions: Tarapur in Retrospect',
Orbis, Vol. 27, Fall 1983.

Copley, Gregory R.,

'India: A New Great Power Arrives',
Defense and Foreign Affairs, Vol. XVI, No. 12, December 1988.

Cronin, Richard P.,
'Prospects of Nuclear Proliferation in South Asia',
The Journal of Middle East and South Asia, Vol. 34, No. 4, Autumn 1983.

Desai, M.J.,
'India and Nuclear Weapons',
Disarmament and Arms Control, Vol. 3, No. 2, Autumn 1965.

Dougherty, James E.,
'Proliferation in Asia',
Orbis, Special Issue, Fall 1975.

Elkins, Jerrold F. and Frederciks, Brian,
'Military Implications of India's Space Program',
Air University Review, May-June 1983.

'India's Space Program: Accomplishments, Goals and Politico-Military Implication',
The Journal of South Asian and Middle Eastern Studies, Vol. 7, Spring 1984.

Elkins, Jerrold F. and Ritezel, W. Andrew,
'The Indo-Pakistani Military Balance',
Asian Survey, Vol. 26, No. 5, May 1986.

Einsentein, Maurice,
'The Third World Missile and Nuclear Proliferation',
Washington Quarterly, Summer 1982.

Frankel, Francine R.,
'Paly the India Card',
Foreign Policy, No. 62, Spring 1986.

Fera, Evan and Srinivasan, Kannan,
'Keeping the Nuclear Option Open',
Economic and Political Weekly, 6 December 1986.

Goheen, Robert F.,
'Problems of Proliferation: U.S. Policy and the Third World',
World Politics, Vol. 35, No. 1, January 1983.

Ghosh, S.K,
'India's Nuclear Programme',
Asian Defence Journal, October 1982.

Gupta, Amit,

'Fire in the Sky',
Defense & Diplomacy, October 1990.

Gupta, Bhabani Sen,
'Why not a Treaty with China',
Frontline, Vol. 5, No. 10, 14-27 May 1988.

Gupta, Shekhar,
'Shooting Ahead',
India Today, 31 March 1988.

Harrison, S. Selig,
'Cut a Regional Deal',
Foreign Policy, No. 62, Spring 1986.

Heimsath, Charles H.,
'The American Quandary over Nuclear Proliferation in the Indian Subcontinent',
USA Today, Vol. 108, January 1980.

Hollen, C. Van,
'Mrs. Gandhi, the General and the Bomb',
Washington Quarterly, Vol. 4, No. 2, Spring 1981.

Jayaramu, P.S.,
'Nuclear Weapons-Free Zone, Non-Proliferation Treaty and South Asia',
IDSA Journal, Vol. 13, July-September 1980.

Joeck, Neil,
'Pakistani Security and Nuclear proliferation in SouthAsia',
The Journal of Strategic Studies, Vol. 8, No. 4, December 1985.

Jones, Rodney W.,
'The Strategic Consequences of Nuclear Proliferation in South Asia: Outlook from the U.S.',
The Journal of Strategic Studies, Vol. 8, No. 4, December 1985.

Kaul, B.N.,
'India's Defence Strategy',
Defence Journal, Vol. IV, No. 3, March 1987.

Kant, Krishan,
'Should India Go Nuclear?,
IDSA Journal, Vol. 24, January-March 1982.

Kapur, Ashok,
'A Nuclearizing Pakistan: Some Hypotheses',
Asian Survey, Vol. 20, No. 5, May 1980.

'India and the Atom',

Bulletin of the Atomic Scientists, September 1974.

'Indian Military Policy and Strategy',
Military Review, Vol. XLIX, No. 7, July, 1969.

'The Canada-India Nuclear Negotiations: Some Hypotheses and Lessons',
The World Today, Vol. 34, No. 8, August 1978.

'The Nuclear Spread: A Third World View',
Third World Quarterly, Vol. 2, No. 1, January 1980.

Khalilzad, Zalmay,
'India's Bomb and the Stability of South Asia',
Asian Affairs, Vol. 5, No. 2, November-December 1977.

'Pakistan and the Bomb',
Survival, 21, December 1979.

'Pakistan: the Making of a Nuclear Power',
ASian Survey, Vol. 16, No. 6, June 1976.

Krishna, Raj,
'India and the Bomb',
India Quarterly, April-June 1965.

Lal, P.C.,
'We Probably Have The Bomb',
World Focus, Vol. 2, No. 6, June 1981.

Levi, Werner,
'Indian Neutralism Reconsidered',
Pacific Affairs, Summer 1964.

Malik, Iftikhar H.,
'The Pakistan-U.S. Security Relationship: Testing Bilateralism',
Asian Survey, Vol. XXX, No. 3, March 1990.

Malik, Yogendra, K. and Vajpeyi, Dhirendra K.,
'The Rise of Hindu Militancy: India's Secular Democracy at Risk',
Asian Survey,
Vol. XXIX, No. 3, March 1989.

Marwah, Onkar,
'India's Nuclear and Space Programs',
International Security, Vol. 2, No. 2, Fall 1977.

'India and Pakistan: Nuclear Rivals in South Asia',
International Organization, Vol. 35, No. 1, Winter 1981.

Mehdi, Syed Sikander,
'India's Nuclear Power: How Much Peaceful',
Pakistan Horizon, 1st Quarter, 1984.

Milhollin, Gary,
'Dateline New Delhi: India's Nuclear Coverup', Foreign Policy, No. 64, Fall 1986.

'Stopping the Indian Bomb', American Journal of International Law, July 1987.

'Heavy-Water Cheaters', Foreign Policy, No. 69, Winter 1987-88.

Mukerjee, Dilip,
'India's Nuclear Test and Pakistan', India Quarterly, Vol 30, No. 4, October-December 1974.

Namboodiri, P.K.S.,
'Pakistan Links: Axis with China', World Focus, Vol. 55, July 1984.

Nandy, Ashis,
'Between Two Gandhis: Psychological Aspects of Nuclearization of India', Asian Survey, No. 11, November 1974.

Noorani, A.G.,
'India's Quest for a Nuclear Security Guarantee', Asian Survey, Vol. 3, No. 7, July 1967.

'Indo-U.S. Nuclear Relations', Asian Survey, Vol. 21, No. 4, April 1981.

Nye, Joseph S.,
'The Logic of Inequality', Foreign Policy, No. 59, Summer 1985.

Oberdorfer, Don,
'Public Hearings on the U.S. Nuclear Cooperation: India's Atomic Blast; Extent of Foreign Aid', DAWN, Karachi, 18 August 1976.

Olgaard, P.L.,
'Verifying a Comprehensive Test Ban', Survival, July-August 1972.

Palmer, Norman D.,
'India's Security Concerns in the 1980s', International Security Review, Vol. 6, Fall 1981.

Petras, James and Morley, Morris,
'Nuclear War and the U.S.-Third world Relations', Political and Economic Weekly, Vol. 23, No. 4, January 1988.

Pressman, Steven,
'House Passes Foreign Aid Authorization',
Washington Quarterly, 12, December 1987.

Power, Pall F.,
'A Nuclearized South Asia?,
Arms Control Today, Vol. Vol. 9, October 1979.

'The Indo-American Nuclear Controversy',
Asian Survey, Vol. 19, No. 6, June 1979.

Potter, William C.,
'The Strategic Consequences of Nuclear Proliferation in South Asia for the soviet Union',
The Journal of Strategic Studies, Vol. 8, No. 4, December 1985.

Praegh, David Van,
'India's Nuclear Delivery system',
Asian Affairs, July-August 1974.

Quester, George H.,
'Some Pakistani problems and Nuclear Non-Solution',
The Journal of Strategic Studies, Vol. 8, No. 4, December 1985.

Rajagopalan, Rajesh,
'The Future of Arms control: What is in it for Us?,
Strategic Analysis, Vol. 12, No. 3, June 1988.

Rajan, M.S.,
'India: A Case of Power without Force',
International Journal, Vol. 30, No. 2, Spring 1975.

Ramanna, Raja,
'A 15 Years Nuclear Programme for India',
Strategic Digest, No. 11, November 1984.

Rais, Rasul B.,
'Pakistan in 1988: From Command to Concialiation Politcs',
Asian Survey, Vol. XXIX, No. 2, February 1989.

Rao, Rama,
'India's Nuclear Progress: a Balance-Sheet',
India Quarterly, Vol. 30, No. 4, October-December 1974.

Rose, Leo E.,
'The Superpowers in South Asia: A Geostrategic Analysis',
Orbis, 22, Summer 1978.

Ray, Aswini K.,
'The "Islamic Bomb" and India's National Security', India Quarterly, Vol. 37, July-September 1981.

Sandoval, R. Robert,
'Consider the Porcupine: Another View of Non Proliferation',
Bulletin of the Atomic Scientists, May 1976.

Schorr, Brian L.,
'Testing Statutory Criteria for Foreign Policy: the Nuclear Non-Proliferation Act of 1978 and the Export of Nuclear Fuel to India',
Journal of International Law and Politics, Vol. 14, Winter 1982.

Singh, Mahendra Prashad,
'The Crisis of the Indian State: From Quiet Developmentalism to Noisy Democracy',
Asian Survey, Vol. XXX, No. 8, August 1990.

Singh, Jasjit,
'South Asia and the Nuclear Threat',
Strategic Analysis, Vol. 12, No. 1, 1988.

Singh, Pushpinder,
'India's Defence Perspective and the Armed Force',
Asian Defence Journal, October 1982.

Sisson, Richard,
'India in 1989: A year of Elections in a Culture of Change',
Asian Survey, Vol. XXX, No. 2, Febuary 1990.

Sondhi, M.L.,
'Notes and Memoranda on the Seminar on Nuclear Weapons and Foreign Policy',
International Studies, October 1967.

Spector, Leonard S.,
'Nuclear Proliferation: Who is Next?,
Bulletin of the Atomic Scientists, May 1987.

Srinivasan, DR. M. R.,
'Reminiscences of Homi Bhabha',
Nuclear India, Vol. 25, No. 5-6, 1987.

Subrahmanyam, K.,
'Do We Really Have a Choice?',
World Focus, Vol. 2, No. 6, 1981.

'Eradicate the Nuclear Cult',
Bulletin of the Atomic Scientists, Vol. 43, No. 3, March 1987.

'The Indian Nuclear Explosion and Its Impact on the Indian Security',
India Quarterly, Vol. 30, No. 4, October-December 1974.

Subramaniam, R.R.,
'China and India: Conflicting Strategic Perspective',
Strategic Analysis, Vol. 12, No. 3, June 1988.

'India's Nuclear Policy',
Strategic Analysis, Vol. 6, No. 7, 1982.

Synder, Jed C.,
'The Non-Proliferation Regime: Managing the Impeding Crisis',
The Journal of Strategic Studies, Vol. 8, No. 4, 1985.

Swamy, Subramaniam,
'A Weapons Strategy for India',
India Quarterly, Vol. 30, No. 4, October-December 1974.

Tahir-kheli, Shirin,
'Pakistan's Nuclear Option and US Policy',
Orbis, Vol. 22, No. 2, Summer 1978.

Tan, Qingshan,
'U.S.-China Nuclear Cooperation Agreement',
Asian Survey, Vol. XXIX, No. 9, September 1989.

Thomas, Ragu G.C.,
'India's Nuclear and Space Programs: Defense or Development',
World Politics, Vol. 38, No. 2, 1986.

'Energy Politics and Indian Security',
Pacific Affairs, Vol. 55, Spring 1982.

'Nuclear Proliferation in South Asia: India's Perspective',
The Journal of Strategic Studies, Vol. 8, No. 4, December 1985.

'Security Relationship in Southern Asia',
Asian Survey, Vol. 21, No. 7, July 1981.

Thorton, Thomas Perry,
'Between the Stools?: U.S. Policy Towards Pakistan during the Carter Administration',
Asian Survey, Vol. 22, October 1982.

Tomar, Ravindra,
'The Indian Nuclear Power Programme: Myths and Mirages',
Asian Survey, Vol. 20, No. 5, May 1980.

Vertzberger, Yaacov,
'India's Strategic Posture and the Border War Defeat of 1962: A Case Study in Miscalculation', The Journal of Strategic Studies, Vol. 5, No. 3, 1982.

Wariavwalla, Bharat,
'India in 1988: Drift, Disarray, or Pattern', Asian Survey, Vol. XXIX, No. 2, Febuary 1989.

Weiss, Anita M.,
'Benazir Bhutto and the Future of Women in Pakistan', Asian Survey, Vol. XXX, No. 5, May 1990.

Wilcox, Wayne A.,
'Strategic Reinsurance for India', Survival, Vol. 14, No. 4, July-August, 1972.

Wohstetter, A.,
'Spreading the Bomb Without Quite Breaking the Rules', Foreign Policy, No. 25, Winter 1976.

Ziring, Lawrence,
'Pakistan in 1989: The Politics of Stalemate', Asian Survey, Vol. XXX, No. 2, February 1990.